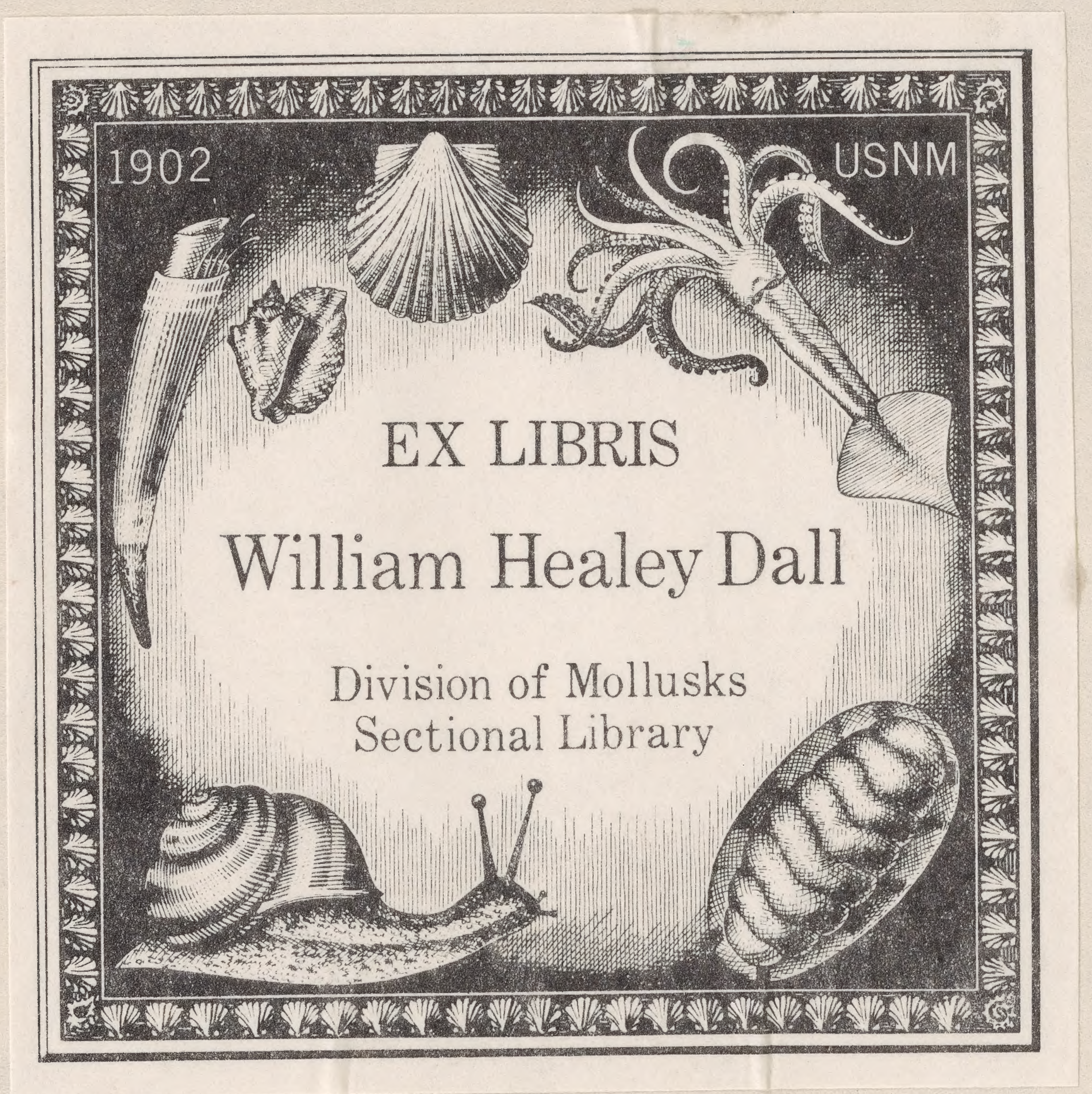

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OBSERVATIONS

ON THE

GENUS UNIO;

TOGETHER WITH

DESCRIPTIONS OF NEW SPECIES IN THE FAMILY UNIONIDÆ,

AND DESCRIPTIONS OF NEW SPECIES OF THE

MELANIDÆ AND PALUDINÆ.

READ BEFORE THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, AND PUBLISHED IN THEIR JOURNAL.

BY

ISAAC LEA, LL. D.,

VICE-PRESIDENT OF THE AMERICAN PHILOSOPHICAL SOCIETY, ETC. ETC.

WITH TWENTY-SIX PLATES.

VOL. XII.

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CONTENTS.

New Unionidæ, Melanidæ and Paludinæ, chiefly of the United States; read June 2d, 1868. Page, ... 9

TO

E. R. SCHOWALTER, M. D.

My Dear Friend:

The present volume, as well as those I have published since 1860, proves how faithfully you have devoted your time to the exploration of the Fresh-water *Mollusca* of the State of Alabama; and the very large number of new species connected with your name, testify how much I have been obliged by your continued friendship and services. Who, therefore, has a greater claim than yourself to the offering of this volume? Your unremitted labors have been crowned with a success that few have achieved anywhere, and I hope that nothing may prevent your accomplishing the complete development of the Malacology of your State, which you have for so many years earnestly sought to perfect.

Very sincerely and very truly yours,

ISAAC LEA, LL. D.

INTRODUCTION.

This volume, while it is chiefly composed of species from the United States, has many from Asia and South America. Some of them are of unusual interest. Of the family *Unionidæ* there are 76, of *Melanidæ* 28, and of *Paludinæ* 1.

The *Unionidæ* from the Tigris River and that part of Asia were given to me by Mr. C. M. Wheatley, and are of more than usual interest, as are those from Don Patricio M. Paz, of Madrid, who sent many in alcohol. By this means I was enabled to examine the soft parts. These have been carefully described, and it will be found that the South American characteristics of the outer hard parts, as well as the included soft parts, which seem to be characteristic of the *Uniones* of that continent, are here exhibited. I allude more particularly to the *round palpi*, or mouth lips, and the *divergent folds* of the tips of the beaks, neither of which forms have I observed in our North American species. Very little attention has been given, heretofore, to the soft parts of the *Unionidæ* of South America, and none, except by myself, to the *embryonic shell.* D'Orbigny, in his "*Voyage Americaine Meridionale*," has imperfectly described and figured some of the soft parts of the genera. Spix takes no notice of these parts of the species which he described and figured with much accuracy. In none of the South American species have I found uteri in the *four leaves* of the branchiæ charged, as in the North American species *U. multiplicatus*, *rubiginosus*, *subrotundus* and *Kleinianus*, nor have any of them *red ova*, as I found in the *rubiginosus*, *subrotundus* and *Æsopus*. Mr. W. M. Gabb, of the California Geological Survey, and Col. E. Jewett very kindly presented me with many new species from Central America, some of which present the singular character of being slightly *inequivalve;* and Major T. C. Downie has contributed many from Georgia. I am also obliged by other friends for their contributions.

In the eleventh volume I mentioned that there were then known of North American species of *Unionidæ* 736 species. In this volume I have described 36 more, which make in all 772. Very recently I have received from several friends a few new ones, which will in due time be described and published.

NEW UNIONIDÆ, MELANIDÆ, ETC.,

CHIEFLY OF THE UNITED STATES.

Unio Homsensis. Pl. 29, fig. 63.

Testa plicata, suboblonga, inæquilaterali, ad latere planulata, postice angulata; valvulis crassis, antice crassioribus; natibus prominulis, ad apices valde corrugatis; epidermide tenebroso-fusca, micanti; dentibus cardinalibus crassis, erectis crenulatisque; lateralibus longis, crassis subrectisque; margarita vel purpurea vel salmonea et iridescente.

Shell plicate, somewhat oblong, inequilateral, flattened at the sides, angular behind; valves thick, thicker before; beaks rather prominent, much corrugated at the tips; epidermis dark brown and shining; cardinal teeth thick, erect and crenulate; lateral teeth long, thick and nearly straight; nacre purple or salmon colored and iridescent.

Proc. Acad. Nat. Sci. 1864, p. 285.

Hab.—Lake Homs, (ancient Emesa,) River Orontes, North Syria, C. M. Wheatley. My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·4, Breadth 2·5 inches.

Shell plicate, somewhat oblong, inequilateral, flattened at the sides, angular behind; substance of the shell thick, thicker before; beaks rather prominent, much corrugated at the tips; ligament large and long; epidermis dark brown, shining, with six to eight nearly equidistant marks of growth; umbonial slope rounded; posterior slope compressed and filled with small folds; cardinal teeth thick, erect and crenulate, single in the right and double in the left valve; lateral teeth long, thick and nearly straight; anterior cicatrices distinct, deeply impressed and corrugate; posterior cicatrices distinct, large and well impressed; dorsal cicatrices placed on the upper part of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks rather deep and angular; nacre purple or salmon colored and iridescent.

Remarks.—Two fine specimens and two odd valves were received; one is beautifully perfect and corrugate for some distance from the tips. The epidermis is without rays, is smooth and shining, and the marks of growth very regular. The folds on the most perfect specimen are numerous and very regular. This species is so much like some of the very thick *U. fluviatilis,* which have been found in the interior of Pennsylvania and some from Virginia, that one might be mistaken for the other, but for the folds and corrugations. The beaks of *Homsensis* are higher and their folds are very different. The anterior part of the shell is also thicker. This is among the many *Unionidæ* which Mr. Wheatley has been able to procure from Western Asia through his friend the Rev. Mr. Beadle.

UNIO ORPHAENSIS. Pl. 29, fig. 64.

Testa lævi, oblonga, inæquilaterali, antice rotundata, postice obtuse subbiangulata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, ad apices crebre et minute undulatis; epidermide olivacea, virido-radiata; dentibus cardinalibus parvis, compressis, crenulatis, in utroque valvulo duplicibus; lateralibus longis subrectisque; margarita vel alba vel aurea et valde iridescente.

Shell smooth, oblong, inequilateral, rounded before, obtusely biangular behind; valves somewhat thick, thicker before; beaks somewhat prominent, closely and minutely undulate at the tips; epidermis olivaceous, with green rays; cardinal teeth small, compressed, crenulated and double in both valves; lateral teeth long and nearly straight; nacre white or golden and very iridescent.

Proc. Acad. Nat. Sci. 1864, p. 285.

Hab.—Tigris River, near Mardin, Pashalic of Orpha, Asiatic Turkey, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1, Length 1·4, Breadth 2·7 inches.

Shell smooth, oblong, inequilateral, rounded before, obtusely biangular behind; substance of the shell somewhat thick, thicker before; beaks somewhat prominent, closely and minutely undulate at the tips; ligament large and deep brown; epidermis olivaceous, with green rays on the posterior part and with distant, well defined marks of growth; umbonial slope rounded; posterior slope narrow-elliptical; cardinal teeth small, compressed, crenulate, corrugate and double in both valves; lateral teeth long, lamellar and nearly straight; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather deep and angular; nacre white or golden and very iridescent.

Remarks.—Quite a number of specimens of different ages were kindly sent to me by Mr. Wheatley for my inspection. In outline it is very near to some varieties of *complanatus*, but it is more inflated and differs in the teeth. None of the specimens were purplish, nor will it be found, I presume, to possess that color. Generally the nacre is golden, but sometimes white. Some of the specimens have fine green rays on the posterior half. The full grown individuals have four or five broad marks of growth. The first growth, forming the beautifully undulate tips, are in all the specimens before me almost white, some of them quite so. The anterior portion of the valves are quite sulcate in some specimens, but it does not pervade enough to put this species in the sulcate division.

UNIO KULLETHENSIS. Pl. 29, fig. 65.

Testa lævi, oblonga, valde inæquilaterali, ad latere planulata, antice subtruncata, postice obtuse angulata; valvulis crassis, antice crassioribus; natibus prominulis; epidermide luteola, postice radiata et tenebroso-viridi; dentibus cardinalibus parvis, acuminatis crenulatisque; lateralibus longis subrectisque; margarita vel alba vel aurea et valde iridescente.

Shell smooth, oblong, very inequilateral, flattened at the sides, subtruncate before and obtusely angular behind; valves thick, thicker before; beaks slightly prominent; epidermis yellowish, radiate and dark green behind; cardinal teeth small, pointed and crenulate; lateral teeth long and nearly straight; nacre white or golden and very iridescent.

Proc. Acad. Nat. Sci. 1864, p. 285.

Hab.—Near Mardin, in a stream from Kulleth falling into the Tigris River, Asia. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·2, Breadth 2·1 inches.

Shell smooth, oblong, very inequilateral, flattened at the sides, subtruncate before and obtusely angular behind; substance of the shell thick, thicker before; beaks slightly prominent; ligament rather short and light brown; epidermis yellowish, radiate and dark green behind, with rather approximate lines of growth; umbonial slope rounded; posterior slope rather depressed and covered with green rays; cardinal teeth small, pointed, double in the left and treble in the right valve; lateral teeth long, nearly straight and rather thick; anterior cicatrices distinct and deeply impressed; posterior cicatrices distinct and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks subangular; nacre white or golden and very iridescent.

Remarks.—I am indebted to Mr. Wheatley for several specimens of this species, with other very interesting ones from the fresh waters of Asia Minor, which seem to have escaped the attention of Naturalists who have travelled through this part of Asia. *Kullethensis* is nearly allied to *Mardinensis*, herein described, but it is a thicker shell and is more inequivalve. In outline it is nearest, of the American species, to *Whiteianus*, (nobis) but in most of its characters very different. The beaks of all the specimens before me are eroded so much as to prevent the character of them being well ascertained, but an appearance of undulation remains sufficiently to designate that they possessed such corrugated wrinkles as most of the species of Western Asia.

UNIO MARDINENSIS. Pl. 30, fig. 66.

Testa lævi, suboblonga, inæquilaterali, antice rotundata, postice obtuse angulata; valvulis subtenuibus, antice crassioribus; natibus prominulis, ad apices crebre et minute undulatis; epidermide luteola, valde radiata; dentibus cardinalibus parvis, acuminatis crenulatisque; lateralibus sublongis subrectisque; margarita aurea et valde iridescente.

Shell smooth, suboblong, inequilateral, rounded before, obtusely angular behind; valves rather thin, thicker before; beaks slightly prominent, closely and minutely undulate at the tips; epidermis yellowish and much rayed; cardinal teeth small, acuminate and crenulate; lateral teeth rather long and nearly straight; nacre golden and very iridescent.

Proc. Acad. Nat. Sci. 1864, p. 286.

Hab.—Tigris River near Mardin, Asiatic Turkey, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·2, Breadth 1·9 inch.

Shell smooth, suboblong, inequilateral, rounded before, obtusely angular behind; substance of the shell rather thin, thicker before; beaks slightly prominent, closely and minutely undulate at the tips; ligament rather short and light brown; epidermis yellowish and much rayed on the posterior portion, with rather distant lines of growth; umbonial slope rounded; posterior slope raised and usually dark green; cardinal teeth small, acuminate and crenulate; lateral teeth rather long and nearly straight; anterior cicatrices distinct and well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks subangular; nacre golden and very iridescent.

Remarks.—Quite a number of specimens of different ages are before me. The younger ones are perfect in the beaks, which display a number of irregular wrinkles, which vary somewhat in different specimens. The cardinal tooth is double in the left and treble in the right valve. The nacre is rich, being usually golden and satin like. In nearly all the specimens the posterior portion is covered with dark green rays. It is nearly allied to *Kullethensis*, herein described, but that shell is more inequilateral, has a less elevated posterior slope and is a thicker shell.

MONOCONDYLŒA MARDINENSIS. Pl. 30, fig. 67.

Testa lævi, arcuata, valde inæquilaterali, ad latere compressa, antice et postice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, recurvis, ad apices minute undulatis; epidermide tenebroso-fusca; dentibus cardinalibus parvis, erectis compressisque; margarita cæruleo-alba et iridescente.

Shell smooth, arcuate, very inequilateral, compressed at the sides, rounded before and behind; valves rather thick, thicker before; beaks a little prominent, recurved and minutely undulate at the tips; epidermis dark brown, cardinal teeth small, erect and compressed; nacre bluish-white and iridescent.

Proc. Acad. Nat. Sci. 1864, p. 286.

Hab.—Near Mardin, in a stream falling into the Tigris River, Asia, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·9, Length 1·6, Breadth 3·1 inches.

Shell smooth, arcuate, very inequilateral, compressed at the sides, rounded before and behind; substance of the shell thick, thicker before; beaks a little prominent, recurved and minutely undulate at the tips; ligament large, long and dark brown, with rather distant marks of growth; umbonial slope rounded; posterior slope narrow, slightly raised, with two slightly impressed lines in each valve from the tips to the posterior margin; cardinal teeth small, erect, compressed, inclining to be double in the left valve, the cleft being angular and deep; anterior cicatrices confluent, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row in and above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather shallow and rounded; nacre bluish-white and iridescent.

Soft Parts.—These were not in alcohol, and were so dried as to present no perfectly developed characters, except that the anal opening was without any papillæ. The *branchial opening* is large, and has large colored papillæ. The palpi seem to be large and subtriangular. No ova or embryos were found in the specimens sent to me by Mr. Wheatley. The mantle is very thin, with a broad margin.

Remarks.—Among a number of interesting shells from Asia I am indebted for this to Mr. Wheatley, who is untiring in efforts to procure from Western Asia the fresh-water shells of that little known country to science. This species has a resemblance to *M. Wheatleyi* (nobis), but that species is not arcuate, and the nacre is brighter and more disposed to be golden, nor does the nacre thicken before. There is also a difference in the color of the epidermis, the *Wheatleyi* being of a light straw color, and having the lines of growth more distant and better defined. The *Mardinensis* has very minute granulations in the cavity of the shell, which along the margin are usually replaced by beautiful minute striæ. Among the species described by M. Bourguignat in De Soulcy's "Voyage Autour de la Mer Morte," that which comes nearest to this species is *Unio Soulcyi*, which is evidently a *Monocondylœa*. It differs from that species in being arcuate, in having larger teeth, in the lines of growth, and other minor characters. The habitat of these shells is thus described in a letter to me from Mr. Wheatley: "These shells are from a stream which flows from Kulleth, joins another from Lore, and together reach the Tigris north of Telshehen. Kulleth is twenty-one miles north, thirty-three east from Mardin, and about fifteen or eighteen miles south of the Tigris."

UNIO EMESAENSIS. Pl. 30, fig. 68.

Testa lævi, subrotunda, inæquilaterali, ad umbones subtumida, antice rotundata, postice obtuse subbiangulata; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominentibus, ad apices valde corrugatis; epidermide rufo-fusca et obsolete radiata; dentibus cardinalibus subcrassis et crenulatis; lateralibus brevibus subrectisque; margarita vel purpurea vel alba vel aurea et valde iridescente.

Shell smooth, subrotund, inequilateral, swollen at the beaks, rounded before and obtusely biangular behind; valves somewhat thick, a little thicker before; beaks prominent and very corrugate at the tips; epidermis reddish-brown and obscurely rayed; cardinal teeth rather thick and crenulate; lateral teeth short and nearly straight; nacre purple, white or golden, and very iridescent.

Proc. Acad. Nat. Sci. 1864, p. 286.

Hab.—Lake Homs, River Orontes, North Syria (ancient Emesa), C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·2, Breadth 1·7 inch.

Shell smooth, subrotund, inequilateral, swollen at the beaks, rounded before and obtusely angular behind; substance of the shell somewhat thick, a little thicker before; beaks prominent and very corrugate at the tips; ligament short, rather thick and light brown; epidermis reddish-brown, obscurely rayed, with distant marks of growth above and close below; umbonial slope rounded; posterior slope elliptical, slightly raised, with two green rays from the tips to the posterior margin; cardinal teeth rather thick, crenulate, single in the right and double in the left valve; lateral teeth short, rather thick and nearly straight; anterior cicatrices distinct and well impressed; posterior cicatrices distinct, rather large and well impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather deep and angular; nacre white, purple or golden and very iridescent.

Remarks.—I have seven specimens of this species from Mr. Wheatley, collected for him by the Rev. Mr. Beadle. Six of these are marked "Lake Homs, North Syria;" and one "Northern Egypt." There is no doubt of their being the same species, and I cannot doubt but that all are from Lake Homs. The oldest specimen is much eroded, with little epidermis remaining, and the nacre destroyed on the surface of the cavity. The others are younger, and show corrugated wrinkles to the tips of the beaks. This species approaches in outline and other characters to that of *semirugatus*, Lam., which I had, in my "Synopsis," considered a variety of *litoralis*, Lam., but which I am now satisfied is distinct, although very closely allied in many of its characters. The *semirugatus* differs from our shell in being more rounded in outline, and the undulations of the beaks differ. It is also redder in the epidermis. In the specimen of *semirugatus* before me,—an authentic specimen from Bagdad,—given to me at the "Museum" in Paris,* there are two sets of undulations, which meet and make acute angles pointing to the tip of the beaks; in the *Emesaensis* there are three sets, and these make two sets of angles which point towards the basal margin.

UNIO MARGINIS. Pl. 31, fig. 69.

Testa lævi, elliptica, inflata, valde inæquilaterali, postice et antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus; epidermide striata, tenebroso-oliva, marginata, obsolete radiata; dentibus cardinalibus parviusculis, valde sulcatis et crenulatis; lateralibus subcurtis rectisque; margarita alba et valde iridescente.

Shell smooth, elliptical, inflated, very inequilateral, rounded before and behind; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis striate, dark olive, margined, obscurely rayed; cardinal teeth rather small, very much sulcate and crenulate; lateral teeth rather short and straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Blue Springs, Dougherty Co., Georgia, Bishop Elliott.

My cabinet and cabinet of Bishop Elliott.

Diam. ·5, Length 1, Breadth 1·1 inch.

Shell smooth, elliptical, inflated, very inequilateral, rounded before and behind; substance of the shell somewhat thick, thicker before; beaks somewhat prominent; ligament very small, thin and light brown; epidermis finely striate, dark olive, obscurely rayed, with a well-marked greenish-yellow margin; umbonial slope rounded; posterior slope narrow and slightly carinate; cardinal teeth rather small, very much sulcate and crenulate; lateral teeth rather short and straight; anterior cicatrices confluent, rather small and deeply impressed; posterior cicatrices confluent, rather small and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the shell; cavity of the shell rather shallow; cavity of the beaks shallow and rounded; nacre white and very iridescent.

Remarks.—Only two specimens were received from Bishop Elliott. It belongs to the group of *parvus*, Barnes, but may easily be distinguished by its epidermis and yellowish margin. It is not quite so transverse as *parvus*. The nacre of both specimens is beautifully white and richly iridescent. Neither of the specimens are perfect enough to show the undulations of the tips. When young, there may be rays exhibited on the upper portions, but with these mature ones the yellow border only slightly presents obscure green rays.

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* Baron Ferussac at the same time (1832) gave me a specimen from Bagdad under the same name, but which evidently is distinct. It is oval, has irregularly corrugate beaks, epidermis olive, cardinal teeth compressed, double in both valves, and has a white nacre. I have great pleasure in proposing the name *U. Ferussacianus* for it, after the distinguished naturalist.

UNIO PROPRIUS. Pl. 31, fig. 70.

Testa lævi, oblonga, subinflata, micanti, inæquilaterali, postice obtuse angulata; antice rotunda; valvulis subtenuibus, antice crassioribus; natibus prominulis, ad apices undulatis; epidermide lutea, eradiata; dentibus cardinalibus parvis, acuminatis, erectis, compressis; lateralibus sublongis subcurvisque; margarita vel purpurea vel salmonis colore tincta et iridescente.

Shell smooth, oblong, somewhat inflated, shining, inequilateral, obtusely angular behind, round before; valves rather thin, thicker before; beaks a little prominent, undulate at the tips; epidermis yellow, eradiate; cardinal teeth small, pointed, erect, compressed; lateral teeth rather long and somewhat curved; nacre purple or salmon and iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Lafayette, Georgia, Rev. G. White.

My cabinet and cabinet of Mr. White.

Diam. ·6, Length ·9, Breadth 1·5 inch.

Shell smooth, oblong, somewhat inflated, inequilateral, shining, obtusely angular behind and round before; substance of the shell rather thin, thicker before; beaks a little prominent, undulate at the tips; ligament short, thin and pale brown; epidermis yellow, eradiate, with distant marks of growth; umbonial slope slightly raised and very obtusely angular; posterior slope narrow elliptical and somewhat carinate; cardinal teeth small, pointed, erect, compressed; lateral teeth rather long, lamellate and somewhat curved; anterior cicatrices distinct, rather large and moderately well impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks rather shallow and obtusely angular; nacre purplish and pale salmon in the cavity, and whitish on the border.

Remarks.—Several specimens are before me. It is a small species, and rather less and thinner than *nitens* (nobis). All these specimens have the nacre white on the margin, with a salmon cavity increasing in tint to a purplish color in the cavity of the beaks. In outline it is very near to *merus* (nobis), but it is not rayed, and it is rather more compressed. It differs in color inside and out. In having a salmon and purplish nacre, it resembles *nitens*. It also reminds us of *buxeus* (nobis). None of the beaks were perfect, but the tips presented three or four rather coarse undulations.

UNIO PROTENSUS. Pl. 31, fig. 71.

Testa lævi, late elliptica, subcompressa, valde inæquilaterali, postice subbiangulata, antice rotunda; valvulis subtenuibus, antice aliquanto crassioribus; natibus prominulis; epidermide tenebroso-fusca, obsolete radiata; dentibus cardinalibus minimis, obliquis striatisque; lateralibus prelongis subcurvisque; margarita vel cæruleo-alba vel salmonea et iridescente.

Shell smooth, widely elliptical, rather compressed, very inequilateral, subbiangular behind, round before; valves rather thin, somewhat thicker before; beaks a little prominent; epidermis dark brown, obscurely rayed; cardinal teeth very small, oblique and striate; lateral teeth very long and slightly curved; nacre bluish white or salmon and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 88.

Hab.—North Carolina, Prof. E. Emmons. R. Eno, near Hillsborough, Orange Co.

My cabinet and cabinet of Prof. Emmons.

Diam. ·4, Length ·8, Breadth 1·6 inch.

Shell smooth, widely elliptical, somewhat compressed, very inequilateral, subbiangular behind, round before; substance of the shell rather thin, somewhat thicker before; beaks a little prominent; ligament rather long and thin; epidermis dark brown, obscurely rayed and with distant marks of growth; umbonial slope slightly raised and obtusely angular; posterior slope very narrow, elliptical and slightly carinate; cardinal teeth very small, oblique and striate; lateral teeth very long and slightly curved; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, rather small and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell very shallow and wide; cavity of the beaks very shallow and obtusely angular; nacre bluish white or salmon and very iridescent.

Remarks.—This is a small species nearly allied to *aquilus* (nobis) in outline, but is very much smaller. In the color of the epidermis and in the small obscure rays they are very much alike. None of the five specimens before me have beaks perfect enough to ascertain the class of undulations of the tips. *Aquilus*, which this species closely resembles, is from Flint River, Georgia. This is one of the many new species collected by my friend, the late Professor Emmons, to whom I am so much indebted for this and other favors.

UNIO AMABILIS. Pl. 31, fig. 72.

Testa lævi, triangulari, micanti, subinflata, inæquilaterali, postice angulata, antice rotunda; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, ad apices undulatis; epidermide vel luteola vel fuscescente, obsolete radiata; dentibus cardinalibus parvis, obliquis, subcompressis; lateralibus sublongis, obliquis corrugatisque; margarita vel alba vel dilute salmonea et valde iridescente.

Shell smooth, triangular, shining, rather inflated, inequilateral, angular behind, round before; valves somewhat thick, thicker before; beaks somewhat prominent, undulate at the tips; epidermis yellowish or brownish, obscurely radiate; cardinal teeth small, oblique, somewhat compressed; lateral teeth rather long, oblique and corrugate; nacre white or pale salmon and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Butler, Taylor Co., Georgia, Dr. H. M. Neisler.

My cabinet and cabinet of Mr. Neisler.

Diam. ·6, Length 1, Breadth 1·4 inch.

Shell smooth, triangular, shining, rather inflated, inequilateral, angular behind, round before; substance of the shell somewhat thick; thicker before; beaks somewhat prominent, undulate at the tips; ligament very short and light brown; epidermis yellowish or brownish, obscurely rayed and with distant marks of growth on the younger and more closely on the older portion; umbonial slope somewhat raised and obtusely angular; posterior slope rather narrow, slightly carinate, with two darkish lines on each valve from the beaks to the posterior margin; cardinal teeth small, oblique, somewhat compressed; lateral teeth rather long, oblique and corrugate; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, rather small and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks shallow and obtusely angular; nacre white or pale salmon and very iridescent.

Remarks.—Seven specimens were sent by Dr. Neisler, among others, from Taylor County. It is so nearly allied to *striatulus* (nobis) that at first I supposed it to be a strong variety. On a more careful examination, I have no longer any doubt but that it differs. It is more oblique, has not the transverse striæ and differs in the undulations of the beaks, which are more developed. The color of the epidermis is also of a brighter yellow in the young. The nacre of *amabilis* is disposed to be of a dilute yellowish salmon color. The older specimens have quite a dark brown epidermis, while the younger are yellowish and brighter. After the third line of growth these lines become much closer. The older specimens are much eroded at the beaks and then they take, in a measure, the outlines of *pyriformis* (nobis). The younger ones remind us of *favosus* (nobis), but this species differs in many respects from that, particularly in the rays, which in *amabilis* are scarcely observable, even on the young specimens; while on *favosus* they are strong and very beautiful. One of the specimens of *amabilis* has perfect beaks, which show five subconcentric folds on the first growth.

UNIO CROMWELLII. Pl. 31, fig. 73.

Testa lævi, elliptica, subinflata, valde inæquilaterali, postice rotundata, antice rotunda; valvulis subtenuibus, antice crassiusculis; natibus subprominentibus, ad apices concentrice plicatis; epidermide minute striata, fusca vel virenti, radiata; dentibus cardinalibus parvis, compressis, corrugatis, in utroque valvulo duplicibus; lateralibus sublongis subcurvisque; margarita purpurescente et valde iridescente.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and round behind; valves rather thin, thicker before; beaks somewhat prominent, concentrically folded at the tips; epidermis minutely striate, brownish or greenish, radiate; cardinal teeth small, compressed, corrugate, double in both valves; lateral teeth rather long and somewhat curved; nacre pale purple and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Kiokee Creek, near Albany, Dougherty Co., Ga., B. M. Cromwell, M.D

My cabinet and cabinets of Dr. Cromwell and Mr. Hallenbeck.

Diam. ·4, Length ·7, Breadth 1·1 inch.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and round behind; substance of the shell thin, thicker before; beaks somewhat prominent, concentrically folded at the tips; ligament small, thin and rather light brown; epidermis minutely striate, brownish or greenish, with a few broad green rays, with distant broad marks of growth; umbonial slope rounded; posterior slope regularly elliptical, carinate, with two broad yellowish rays on each valve; cardinal teeth small, compressed, corrugate, double in both valves; lateral teeth rather long and somewhat curved; anterior cicatrices scarcely distinct, rather large and well impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks small and obtusely angular; nacre pale purple and very iridescent.

Remarks.—Mr. Hallenbeck sent me a suite of fine specimens of this pretty little species. At first I thought it might be a variety more perfect than usual of *paulus* (nobis), although closely allied to that species. The two yellow rays on the posterior slope of each valve are larger and more distinct, and the carina is higher. It also differs in the undulations of the beaks, and is rather thinner. The nacre in all the five specimens is purple, which is not the case with the *paulus*. In the nacre and in the outline it is allied to *glans* (nobis), but in the epidermis and beaks it is entirely different, as well as being a thinner shell. It belongs to that group of which *parvus* (Barnes) may be considered the type, but differs in the epidermis, the nacre and the undulations of the beaks. I name it after Dr. Cromwell, who found it and gave it to Mr. Hallenbeck.

UNIO LYONII. Pl. 32, fig. 74.

Testa lævi, subrotunda, subcompressa, inæquilaterali; valvulis subcrassis, antice crassioribus; natibus prominentibus; epidermide rufo-fusca, late radiata; dentibus cardinalibus subgrandibus, subcompressis corrugatisque; lateralibus crassis, obliquis subcurvisque; margarita dilute salmonea et valde iridescente.

Shell smooth, subrotund, somewhat compressed, inequilateral; valves rather thick, thicker before; beaks prominent; epidermis reddish-brown, with broad rays;

cardinal teeth rather large, somewhat compressed and corrugate; lateral teeth thick, oblique and somewhat curved; nacre pale salmon and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—East Tennessee, Major S. S. Lyon, U. S. E.

My cabinet.

Diam. ·8, Length 1·5, Breadth 1·8 inch.

Shell smooth, subrotund, somewhat compressed, inequilateral; substance of the shell somewhat thick, thicker before; beaks prominent; ligament rather short, thick and light brown; epidermis reddish-brown, with dark broad rays over the middle of the valves and with distant marks of growth; umbonial slope flattish; posterior slope narrow and very slightly carinate; cardinal teeth rather large, somewhat compressed and corrugate; lateral teeth thick, oblique, somewhat curved and corrugate; anterior cicatrices confluent, rather large and well impressed; posterior cicatrices confluent, rather small and impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and obtusely angular; nacre pale salmon and very iridescent.

Remarks.—A single specimen only was received from Major Lyon. The exact habitat not mentioned, but I presume it came from near Cumberland Gap. In outline it is near to *Leseuerianus* (nobis), but it is not quite so rotund. It is a more compressed species, differs in color of the epidermis and in the rays. It also resembles *pudicus* (nobis), but that shell in a perfect state is triangular and thinner. The rays are somewhat like those of *Holstonensis* (nobis). The nacre of the specimen before me is very fine, and the salmon tint very agreeable. It is likely that specimens may be found to be white. I have great pleasure in dedicating the species to Major Lyon, late of the Engineer Corps U. S. Army, to whom I am indebted for many species of molluscs from the western waters.

UNIO DOLIARIS. Pl. 32, fig. 75.

Testa lævi, elliptica, valde inflata, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis subtenuibus, antice crassioribus; natibus prominentibus, valde inflatus; epidermide viridi-lutea, radiis undique indutis; dentibus cardinalibus erectis, acuminatis, compresso-conicis crenulatisque; lateralibus sublongis, curvatis, lamellatis corrugatisque; margarita alba et valde iridescente.

Shell smooth, elliptical, very much inflated, inequilateral, obtusely angular behind, rounded before; valves rather thin, thicker before; beaks prominent, very much inflated; epidermis greenish-yellow, covered all over with rays; cardinal teeth erect, pointed, compressed conical and crenulate; lateral teeth rather long, lamellar, curved and corrugate; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Etowah River, Georgia, Rev. G. White.

My cabinet and cabinet of Mr. White.

Diam. 1·1, Length 1·6, Breadth 2·3 inches.

Shell smooth, elliptical, very much inflated, inequilateral, obtusely angular behind and rounded before; substance of the shell rather thin, thicker before; beaks prominent, very much inflated; epidermis greenish-yellow, with distant marks of growth, covered all over with thin, rather distant rays; ligament rather short, thick and dark brown; umbonial slope much raised and very obtusely angular; posterior slope broad, slightly carinate, subcordate; cardinal teeth erect, pointed, compressed conical and crenulate; lateral teeth rather long, lamellar, curved and corrugate; anterior cicatrices confluent, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed on the upper part of the centre of the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks deep and obtusely angular; nacre white and very iridescent.

Remarks.—This species belongs to the group which embraces *multiradiatus* (nobis), *perovalis*, Con., *Spillmanii* (nobis) and *perradiatus* (nobis). It is a much thinner shell than *Spillmanii*, and is rather more inflated. It is very like *perradiatus*, but differs in being more elliptical, that shell being subtriangular, the valves somewhat thicker, and the rays broader and closer together. There is a disposition in nearly all the specimens before me to be slightly tinged with salmon color in the cavity of the beaks. In some of the specimens the green rays, which generally diverge over the whole disk, are well marked and nearly equidistant.

UNIO PUNCTATUS. Pl. 32, fig. 76.

Testa lævi, elliptica, ad latere planulata, valde inæquilaterali, postice et antice rotundata; valvulis crassis, antice aliquanto crassioribus; natibus vix prominentibus; epidermide olivacea, radiis punctatis undique indutis; dentibus cardinalibus parvis, compresso-conicis crenulatisque; lateralibus longis, crassis subcurvisque; margarita argentea et iridescente.

Shell smooth, elliptical, flattened at the sides, very inequilateral, rounded before and behind; valves thick, somewhat thicker before; beaks scarcely prominent; epidermis olivaceous, covered with interrupted rays; cardinal teeth small, compressed conical and crenulate; lateral teeth long, thick and somewhat curved; nacre silvery white and iridescent.

Proc. Acad. Nat. Sci. 1865, p. 89.

Hab.—Caney Fork, Tenn., Dr. Edgar; and Tuscumbia, Ala., B. Pybas.

My cabinet and cabinet of Mr. Pybas.

Diam. ·8, Length 1·4, Breadth 2·2 inches.

Shell smooth, elliptical, flattened on the sides, very inequilateral, rounded before and behind; substance of the shell thick, somewhat thicker before; beaks scarcely prominent; ligament short, thick and dark brown; epidermis olivaceous, inclining to yellow, covered with interrupted rays which produce elongated subquadrate spots, with rather distant marks of growth; umbonial slope raised and rounded; posterior slope narrow elliptical, subcarinate and slightly impressed; cardinal teeth small, compressed conical and crenulate; lateral teeth long, thick, somewhat curved and corrugate; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, large and moderately well impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell very shallow; cavity of the beaks very shallow and obtusely angular; nacre silvery white and iridescent.

Remarks.—I have seven specimens of this species from Dr. Edgar and Mr. Pybas; a single specimen from Dr. Edgar a long time since. It is very nearly allied to *Lindsleyi* (nobis), but is a smaller species, not so bright in the epidermis, nor are the spots so distant and square. *Punctatus* is thicker, more lenticular, and has smaller cardinal teeth. It belongs to that group of which *interruptus* (nobis) may be considered the type. None of the specimens had beaks perfect enough to designate the kind of undulations of the tips, but the whole group seem to be very much alike in this respect.

UNIO PARCUS. Pl. 33, fig. 77.

Testa lævi, late elliptica, subinflata, valde inæquilaterali, postice subrotundata, antice rotunda; valvulis subtenuibus, antice aliquanto crassioribus; natibus prominulis, ad apices divaricate undulatis; epidermide polita, tenebroso-oliva, eradiata; dentibus cardinalibus parviusculis, obliquis lamellatisque; lateralibus longis, lamellatis subrectisque; margarita cæruleo-alba et iridescente.

Shell smooth, widely elliptical, rather inflated, very inequilateral, rounded behind and round before; valves rather thin, somewhat thicker before; beaks a little prominent, with divergent folds at the tips; epidermis polished, dark olive, without rays; cardinal teeth rather small, oblique and lamellar; lateral teeth long, lamellar and nearly straight; nacre bluish-white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. ·5, Length ·7, Breadth 1·4 inch.

Shell smooth, widely elliptical, rather inflated, very inequilateral, rounded behind and round before; substance of the shell rather thin, somewhat thicker before; beaks a little prominent, with divergent folds at the tips; ligament thin and light brown; epidermis polished, dark olive, without rays, with distant marks of growth; umbonial slope rounded; posterior slope narrow, rather depressed, roughish; cardinal teeth small, oblique, lamellar, single in the left and double in the right valve; lateral teeth long, lamellar and nearly straight; anterior cicatrices confluent and slightly impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell wide and somewhat deep; cavity of the beaks shallow and subangular; nacre bluish-white and iridescent.

Soft Parts.—A single dried specimen only was received. It was so poor that I was only enabled to make out the ova in the ovarium and in the branchial uterus. These ova were not sufficiently advanced to make out the embryonic form perfectly, but they were enough so as to show that it was pouch-shape. The branchial opening was mutilated as well as the palpi and the papillæ.

Remarks.—A single specimen only is before me. It is a small species, and this individual is about an inch wide. It probably is not quite grown. In outline it is near to *ellipticum*, Spix, but is more nearly allied to *inornatus* (nobis). It cannot be confounded with either. The epidermis is of a brilliant polish, and the single band of growth is distinctly marked by a dark and yellow line. The cardinal tooth, being double in the right and single in the left valve, is of an unusual character.

UNIO APPRIMUS. Pl. 33, fig. 78.

Testa lævi, elliptica, inflata, inæquilaterali, postice emarginata, obtuse angulata, antice rotundata; valvulis percrassis, antice crassioribus; natibus subprominentibus, ad apices divaricate undulatis; epidermide castanea, micanti, substriata, obsolete radiata; dentibus cardinalibus grandibus et valde partitis; lateralibus prælongis, lamellatis, curvatis et decore granulatis; margarita argentea et iridescente.

Shell smooth, elliptical, inflated, inequilateral, obtusely angular and emarginate behind and rounded before; valves very thick, thicker before; beaks rather prominent, with divergent folds at the tips; epidermis chestnut-brown, shining, somewhat striate and obscurely rayed; cardinal teeth large and very much divided; lateral teeth very long, lamellar, curved and beautifully granulate; nacre silver-white and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1·7, Length 2·6, Breadth 3·9 inches.

Shell smooth, elliptical, inflated, inequilateral, obtusely angular and emarginate behind and rounded before; substance of the shell very thick, thicker before; beaks rather prominent, with divergent folds at the tips; ligament large and light brown; epidermis chestnut-brown, shining, somewhat striate, obscurely rayed, with distant marks of growth; umbonial slope rounded and inflated; posterior slope rather wide, elliptical, with an indistinct furrow on each valve; cardinal teeth large and very much divided in each valve; lateral teeth very long, lamellar, curved and beautifully granulate; anterior cicatrices confluent, very large and very deeply impressed; posterior cicatrices confluent and well impressed; dorsal cicatrices placed across the centre of the cavity of the beaks; cavity of the shell rather deep and very wide; cavity of the beaks shallow and rounded; nacre beautifully silver-white and iridescent.

Remarks.—It is much to be regretted that a single specimen only of this fine species, and without the soft parts, should have been procured. In some respects it resembles some of our North American species, but that unerring characteristic of divergent folds of the tips emphatically places it as an inhabitant of the fresh waters of South America. In outline it approaches *Weldonensis* (nobis) and *Charlottensis* (nobis), as well as some varieties of *complanatus* (Solander), but it is not so wide. In the cardinal teeth it differs entirely from these. In outline it also approaches *Uruguayensis* (nobis), but it differs much from that species in outline as well in the cardinal and lateral teeth. The regular ellipse, the smooth polished umbos and the much divided large cardinal teeth well characterize this species. In each valve the cardinal tooth is divided into six compressed corrugate parts, larger or smaller, and the lamellar teeth are beautifully granular and iridized. Although the substance of the shell is very thick, and the anterior cicatrices deeply impressed, the two lower ones are confluent, while the third,—the upper one not usually noted,—is deeply impressed and distinct from the great one beneath. In the lateral tooth of the left valve the upper division is exceedingly small in this specimen, and it may be a general character of the species.

UNIO LOCELLUS. Pl. 33, fig. 79.

Testa lævi, elliptica, valde inflata, inæquilaterali, postice subrotundata, antice subtruncata; valvulis tenuibus; natibus subprominentibus, tumidis, ad apices divaricate undulatis; epidermide tenebroso-fusca, obsolete radiata, antice striata; dentibus cardinalibus parvis, valde compressis, valde obliquis, in utroque valvulo duplicibus; lateralibus parviusculis, lamellatis; margarita cæruleo-alba et iridescente.

Shell smooth, elliptical, very much inflated, inequilateral, somewhat rounded behind, subtruncate before; valves thin; beaks rather prominent, swollen, with divergent folds at the tips; epidermis dark brown, obscurely rayed, striate before; cardinal teeth small, very much compressed, very oblique and double in both valves; lateral teeth rather small and lamellar; nacre bluish white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—Buenos Ayres, South America, Don Patricio M. Paz.

My cabinet and cabinet of Don. P. M. Paz.

Diam. ·8, Length 1·2, Breadth 1·8 inch

Shell smooth, elliptical, very much inflated, inequilateral, somewhat rounded behind and subtruncate before; substance of the shell thin; beaks rather prominent, swollen, with divergent folds at the tips; ligament very small and light brown; epidermis dark brown, obscurely rayed, with distant marks of growth, striate on the anterior half; umbonial slope rounded and very much inflated; posterior slope elliptical, rather wide, with an indistinct furrow in each valve; cardinal teeth small, very much compressed, very oblique and double in both valves; lateral teeth rather small, nearly straight, thin and lamellar; anterior cicatrices confluent and slightly impressed; posterior cicatrices confluent and scarcely visible; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks very shallow and rounded; nacre bluish white and iridescent.

Remarks.—Of this well characterised little species there was only a single specimen received. In outline it is near to *Bengalensis* (nobis), but it is more inflated, has larger teeth and a thicker and white nacre. It differs from *ampullaceus*, herein described, in being elliptical, more inflated over the umbones, and being a much lighter shell. The beaks well display the divergent folds at the tips, a character so well denoting its South American origin.

UNIO PECULIARIS. Pl. 34, fig. 80.

Testa lævi, quadrata, compressiuscula, inæquilaterali, postice obtuse angulata, antice rotunda; valvulis crassiusculis, antice aliquanto crassioribus; natibus subprominentibus, ad apices divaricate undulatis, ; epidermide viridi-fusca, eradiata; dentibus cardinalibus parviusculis, compressis, obliquis, in utroque valvulo duplicibus; lateralibus longis, lamellatis curvisque; margarita cæruleo-alba et iridescente.

Shell smooth, quadrate, somewhat compressed, inequilateral, obtusely angular behind, round before; valves a little thick, somewhat thicker before; beaks a little prominent, with divergent folds at the tips; epidermis greenish-brown, without rays; cardinal teeth rather small, compressed, oblique and double in both valves; lateral teeth long, lamellar and curved; nacre bluish white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 33.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don. P. M. Paz.

Diam. ·9, Length 1·3, Breadth 2 inches.

Shell smooth, quadrate, somewhat compressed at the sides and inflated on the umbonial slope; inequilateral, obtusely angular behind, round before; substance of the shell somewhat thick, slightly thicker before; beaks a little prominent, slightly inflated, with divergent folds at the tips; ligament small and very dark; epidermis greenish-brown, without rays and with very indistinct marks of growth; umbonial slope inflated and rounded; posterior slope narrow, elliptical, with an indistinct impressed line in each valve; anterior cicatrices confluent, rather small and slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices in a row across the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre bluish white and iridescent.

Soft parts.—*Branchial uterus* occupies nearly the whole width of the inner branchiæ, the ovisacks being long, closely approximate and filled with nearly mature embryonic shells; ova were found in the ovaries also. *Branchiæ* rather large, rounded below, inner ones much the larger, united the whole length of abdominal sack. *Palpi* rather small, somewhat thin, oblique, rounded below and united a small distance on the posterior superior edges. *Mantle* thin, slightly thickened at the edges. *Branchial opening* rather small, with numerous small, brownish papillæ. *Anal opening* small, without papillæ and entirely separated from the branchial opening. Has no *superanal opening*; color of the mass dirty white.

Embryonic shell subtriangular, light brown; dorsal line rather long and straight; side margins irregular and unequal; one being a segment of a circle, the other an irregular curved line, forming an obtuse angle at the base; basal margin obtusely angular and furnished with hooks; granulate over the whole surface. Plate 34, fig. 80.

Remarks.—There were two only of this species, both in alcohol; male and female. The female fortunately had the embryonic shell nearly matured, and that presents to us a unique and very peculiar form in having unequal lateral margins, as described above. It therefore has the appearance of being abnormal and lapsided. No irregularity approaching to this has been observed by me in the numerous North American species which I have examined.

In outline *peculiaris* is near to *Bengalensis* (nobis), but in other respects it is very different, having divergent folds on the beaks, a white and thicker nacre, etc. Of all the South American species with which I am acquainted, it most nearly resembles *Wymanii* (nobis), but may easily be distinguished by its darker epidermis, its greater inflation and in being a smaller species. There is a slight indication of triplication of the cardinal tooth of the left valve in both the specimens.

UNIO RUGOSOSULCATUS. Pl. 34, fig. 81.

Testa sulcata, triangulari, subinflata, subæquilaterali, postice biangulata, antice oblique rotundata; valvulis percrassis, antice crassioribus; natibus prominentibus; epidermide olivacea, rugoso-sulcata, obsolete radiata; dentibus cardinalibus crassis, rugosis, elevatis; lateralibus sublongis, subcrassis, lamellatis subcurvisque; margarita argentea et iridescente.

Shell sulcate, triangular, somewhat inflated, nearly equilateral, biangular behind and obliquely rounded before; valves very thick, thicker before; beaks prominent; epidermis olive color, roughly sulcate, obscurely rayed; cardinal teeth thick, rugose and raised; lateral teeth rather long, rather thick, lamellar and slightly curved; nacre silvery white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 33.

Hab.—Central America, Don. Patricio M. Paz.

My cabinet and cabinet of Don. P. M. Paz.

Diam. 1·4, Length 2·2, Breadth 3 inches.

Shell sulcate, triangular, somewhat inflated, nearly equilateral, biangular behind and obliquely rounded before; substance of the shell very thick, thicker before, with a broad and thickened border; beaks prominent, rather pointed; ligament rather large and light brown; epidermis olive color, darker on the umbones and posterior slope, with distant, indistinct marks of growth; umbonial slope angular; posterior slope narrow elliptical, with an indistinct furrow on each valve; cardinal teeth large, thick, rugose, raised and obtusely pointed; lateral teeth rather long, rather thick, lamellar and slightly curved; anterior cicatrices distinct, very large and well impressed; posterior cicatrices confluent, very large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks obtusely angular and somewhat deep; nacre silvery white and iridescent.

Remarks.—There were two specimens, nearly of the same size, sent to me by Don P. M. Paz. The species is very distinct, and belongs to that sulcate group which generally prevails with the Central American species. The specimens were marked as coming from the United States, but I have no hesitation in saying that this must be an error; the species having all the analogous characteristics of the Central American species. It has some resemblance to *U. Estabrookianus* (nobis), but is much thicker, higher in the beaks, more sulcate and darker colored. It is allied to *Newcombianus* (nobis), from Lake Nicaragua, and might be taken for the old of that species, but it is very much larger, very much heavier, more inflated, has a much more corrugate surface and is not so lenticular. In the *rugosulcatus* the nacre is of a remarkably pure pearly white, and on the umbones and beaks the olive color is nearly replaced by a greenish brown color.

UNIO FIRMUS. Pl. 34, fig. 82.

Testa lævi, elliptica, subinflata, valde inæquilaterali, postice et antice rotundata; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominulis; epidermide viridi-fusca, eradiata; dentibus cardinalibus subcrassis, compressis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subcurvisque; margarita argentea et valde iridescente.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and behind; valves rather thick, thicker before; beaks slightly prominent; epidermis greenish brown, without rays; cardinal teeth somewhat thick, compressed and double in both valves; lateral teeth long, lamellar and somewhat curved; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 33.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1, Length 1·4, Breadth 2·4 inches.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and behind; substance of the shell rather thick, thicker before; beaks slightly prominent; ligament rather long and light brown; epidermis greenish brown, without rays, with distant marks of growth; umbonial slope rounded and inflated; posterior slope narrow, elliptical, and very slightly carinate, with indistinct impressed lines in each valve; cardinal teeth somewhat thick, compressed and double in both valves; lateral teeth long, lamellar and somewhat curved; anterior cicatrices confluent, rather small and deeply impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and rounded; nacre silver white and very iridescent.

Soft parts.—*Branchial uterus* occupies nearly the whole width of the inner branchiæ, the ovisacks being long, closely approximate and filled with nearly mature embryonic shells. Ova were found still in the ovaries. *Branchiæ* rather large, outer ones much rounded, inner ones larger and nearly straight at the basal edge, united the whole length of the abdominal sack. *Palpi* rather small, rather thick, obliquely rounded below and united a short distance on the posterior edges. *Mantle* thin, much thickened at the posterior edges. *Branchial opening* rather small, dark brown, with regular, rather small papillæ. *Anal opening* very small, without papillæ and entirely disunited from the branchial opening below. No super-anal opening. Color of the mass dirty white.

Embryonic shell subtriangular, light brown; dorsal line rather long and straight; side margins slightly curved outward, forming an obtuse angle at the base; basal margin obtusely angular and furnished with hooks; granulate over the whole surface. Pl. 34, fig. 82.

Remarks.—Four specimens of this species were brought by Don P. M. Paz, two of them, a male and female, in alcohol, and from which the above descriptions were made. In connection with the description of the embryonic shell it may be mentioned that it is, I believe, the first time this has been done in regard to South American species. In outline *firmus* is closely allied to *caliginosus* (nobis), but it is a heavier species, with a brighter nacre and a less dark epidermis. In the specimens before me the nacre is much worn and the substance of the shell eroded. The beaks are so much eroded that there are no remains of divergent folds with which they were no doubt once clothed. It is nearly allied to *Paraguayensis,* herein described, but differs much in the elliptical outline.

UNIO AMPULLACEUS. Pl. 35, fig. 83.

Testa lævi, suboblonga, valde inflata, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, inflatis; epidermide tenebroso-fusca, rugoso-striata, eradiata; dentibus cardinalibus parvis, obliquis, lamellatis, in utroque valvulo duplicibus; lateralibus longis, subrectis, lamellatis corrugatisque; margarita alba et iridescente.

Shell smooth, oblong, very much inflated, inequilateral, obtusely angular behind and rounded before; valves somewhat thick, thicker before; beaks prominent and inflated; epidermis dark brown, rugosely striate and without rays; cardinal teeth small, oblique, lamellar and double in both valves; lateral teeth long, nearly straight, lamellar and corrugate; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1·1, Length 1·5, Breadth 2·5 inches.

Shell smooth, oblong, very much inflated, inequilateral, obtusely angular behind and rounded before; substance of the shell somewhat thick, thicker before; beaks prominent and inflated; ligament rather small and dark brown; epidermis dark brown, rugosely striate, without rays and with rather distant marks of growth; umbonial slope rounded and much inflated; posterior slope elliptical, somewhat carinate, rather wide, very dark brown and with an impressed line in each valve; cardinal teeth small, oblique, lamellar and double in both valves; lateral teeth long, nearly straight, lamellar and corrugate; anterior cicatrices confluent, rather large and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed across the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks very shallow and rounded; nacre white and iridescent.

Remarks.—A single specimen only of this species was received. The beaks are much eroded, but still an indistinct indication remains of the divergent character of the tips. In outline it is closely allied to *Mexicanus,* Phili., but differs entirely in the teeth and the color of the nacre. It is also very near to *Charruanus,* D'Orb., but is more inflated and not so wide. It reminds one of *Blandingianus* (nobis), but is more quadrate than that shell and less oblique. In the specimen before me there are slightly impressed lines running from the beaks to the anterior half of the margin which give the surface a rugose character. There is also a slight emargination at the posterior basal margin which may not pertain to all other specimens.

UNIO ACUTIROSTRIS. Pl. 35, fig. 84.

Testa lævi, oblonga, ad latere compressa, valde inæquilaterali, postice obtuse angulata, antice truncata; valvulis crassiusculis, antice crassioribus; natibus prominulis; epidermide tenebroso-fusca, nigrescente, eradiata; dentibus cardinalibus parviusculis, in utroque valvulo sulcato-divergente; lateralibus prælongis, aliquanto curvatis granulatisque; margarita alba et valde iridescente.

Shell smooth, oblong, compressed at the sides, very inequilateral, obtusely angular behind and truncate before; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis dark brown, nearly black, without rays; cardinal teeth rather small, in both valves sulcate and divergent; lateral teeth very long, curved and granulate; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1, Length 1·6, Breadth 2·4 inches.

Shell smooth, oblong, compressed at the sides, very inequilateral, obtusely angular behind and truncate before; substance of the shell somewhat thick, thicker before; beaks somewhat prominent; ligament long, thin and very dark brown; epidermis dark brown, nearly black, somewhat striate, with distant marks of growth; umbonial slope long and obtusely angular; posterior slope long, compressed at the sides and somewhat carinate; cardinal teeth rather small, in both valves sulcate and divergent; lateral teeth very long, curved and granulate; anterior cicatrices confluent, rather small and well impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed across the centre of the cavity of the beaks; cavity of the shell shallow and very wide; cavity of the beaks very shallow; nacre white and very iridescent.

Soft Parts.—*Branchial uterus* occupies nearly the whole width of the inner branchia, the ovisacks being somewhat long, closely approximate and filled with ova which appear to be elliptical and not matured. Ova were also found in the ovaries. *Branchiæ* very long, the outer one curved, the inner nearly straight at the basal margin and much the larger, united the whole length of the abdominal sack. *Palpi* large, rather thick, round below and united only at the upper edges. *Mantle* thin, slightly thickened at the edges. *Anal opening* rather large, without papillæ and entirely separated from the branchial opening. No *super-anal opening*. Color of the mass dirty white.

Remarks.—This was a single female specimen of a species interesting from its unusual outline. The ova were not sufficiently advanced to give one an idea of the form the embryonic shell would take. The *palpi* or mouth-lips have that peculiar round form which I have elsewhere described, and which seems peculiar to South American species.* It is to be regretted that this species, with so peculiar an outline, should not have had the embryonic form to examine, as it would probably present a very distinct form. In the specimen before me the posterior basal margin is slightly arcuate, but this character may not strictly pertain to the species, as the lines of growth above do not present this inward curve. The beaks are very much eroded, so much so as to obliterate the usual diverging folds which they no doubt once possessed. The perpendicular truncation of the anterior margin and the beak-like posterior margin are very characteristic of the species. The cardinal teeth are also quite peculiar in their form, being sub-divided into about a dozen sections (denticles) diverging from a point immediately under the tip of the beaks. In outline it is allied to that rare South American species which I described under the name of *parallelopipedon*, from Rio Parana and Rio Plata; but it is a larger species, not quite so transverse, and differs in the color of the epidermis as well as the form of the cardinal teeth.

UNIO PARAGUAYENSIS. Pl. 35, fig. 85.

Testa lævi, elliptica, inflata, sublenticulari, valde inæquilaterali, postice et antice rotundata; valvulis subcrassis, antice crassioribus; natibus vix prominentibus; epidermide viridi-fusca, obsolete radiata; dentibus cardinalibus crassiusculis, obliquis, compressis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis curvisque; margarita argentea et valde iridescente.

Shell smooth, elliptical, inflated, sublenticular, very inequilateral, rounded before and behind; valves somewhat thick, thicker before; beaks scarcely prominent; epidermis greenish-brown, obscurely rayed; cardinal teeth a little thick, oblique, compressed, double in both valves; lateral teeth rather long, lamellar and curved; nacre silvery-white and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—Paraguay, South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1·2, Length 1·7, Breadth 2·5 inches.

Shell smooth, regularly elliptical, inflated, somewhat lenticular, very inequilateral, rounded before and behind; substance of the shell somewhat thick, thicker before; beaks inflated, scarcely prominent; ligament rather small and dark brown; epidermis greenish-brown, obscurely rayed; umbonial slope rounded and inflated; posterior slope elliptical, somewhat carinate, with two slightly impressed lines in each valve; cardinal teeth somewhat thick, oblique, compressed, double in the right and disposed to be treble in the left valve; lateral teeth long, lamellar and slightly curved; anterior cicatrices confluent and deeply impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks rather shallow and rounded; nacre silver-white and beautifully iridescent.

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* Trans. Acad. Nat. Sci., vol. 5, p. 391. Observations, vol. 10, p. 27.

Remarks.—A single specimen only was received. The elliptical outline of this species is very perfect, exhibiting great regularity. In this character it closely resembles *regularis* (nobis), but in the form of the teeth and in its inflation it is totally different. It is most nearly allied, of all the South American species with which I am acquainted, to *piceus* and *lepidus* (nobis), but cannot be confounded with either, being a larger and wider species, and being elliptical in outline. The disposition to be treble in the left valve may be only occasionally so. In this specimen it is separate from the two larger divisions below. The specimen is too much eroded at the beaks to exhibit the usual divergent character of the folds of the tips, and the epidermis is so much removed that the description of it is necessarily very imperfect.

MONOCONDYLŒA LENTIFORMIS. Pl. 36, fig. 86.

Testa lævi, rotundata, lenticulari, valde inæquilaterali, postice rotundata, antice curta rotundaque; valvulis subcrassis, antice crassioribus; natibus prominentibus, ad apices acuminatis, retusis; epidermide tenebroso-oliva, striata, radiata; dentibus cardinalibus parviusculis, tuberculatis; margarita albida et valde iridescente.

Shell smooth, rounded, lenticular, very inequilateral, rounded behind, short and round before; valves rather thick, thicker before; beaks prominent, acuminate at the tips, retuse; epidermis dark olive, striate and eradiate; cardinal teeth rather small, tuberculate; nacre whitish and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. ·7, Length 1·3, Breadth 1·6 inch.

Shell smooth, rounded, lenticular, very inequilateral, rounded behind, short and round before; substance of the shell rather thick, thicker before and near the basal margin; beaks prominent, acuminate at the tips and retuse; ligament small and very dark brown, almost concealed; epidermis dark olive, striate and without rays; umbonial slope flattened; posterior slope narrow elliptical, carinate, with two greenish lines on each valve from the tips to the posterior margin; cardinal teeth rather small, tuberculate and somewhat erect; anterior cicatrices confluent, large and moderately well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices concealed in the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and angular; nacre whitish, tinted with salmon and very iridescent.

Remarks.—A single specimen only was received, and that without the soft parts. It differs from all the South American species described by D'Orbigny and Moricand in being of almost a perfect lenticular form. It is about the size of *Franciscana*, Mori., but cannot be confounded with that species, which is lighter and thinner in the substance of the shell and much more inflated and higher in the carina. The specimen before me has the greatest transverse axis about the middle of the disks, and the enlarged or thickened nacre towards the base is unusually great. The greenish-blue of the tips of the beaks arises from epidermal deposit on the interior, which in this specimen is quite remarkable. The tooth of the right valve shuts in behind that of the left valve, which is usual with South American species.

MONOCONDYLŒA PAZII. Pl. 36, fig. 88.

Testa lævi, obovata, inflata, valde inæquilaterali, postice rotundata, antice curta rotundaque; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominentibus, tumidis, retusis; epidermide tenebroso-oliva, striata, eradiata; dentibus cardinalibus subcrassis, compresso-tuberculatis, subelevatis; margarita alba et valde iridescente.

Shell smooth, obovate, inflated, very inequilateral, rounded behind, short and round before; valves somewhat thick, slightly thicker before; beaks prominent, swollen, retuse; epidermis dark olive, striate, without rays; cardinal teeth rather thick, compressed tuberculate and somewhat raised; nacre pearly-white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 34.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Diam. 1, Length 1·5, Breadth 2·2 inches.

Shell smooth, obovate, inflated, slightly flattened on the umbones, very inequilateral, rounded behind, round and short before; substance of the shell somewhat thick, slightly thicker before; beaks prominent, swollen and drawn backwards; ligament rather small and dark brown; epidermis dark olive, rather coarsely striate and without rays; umbonial slope rounded and very much inflated; posterior slope subcordate, subcarinate, with two indistinct lines on each valve from the beaks to the posterior margin; cardinal teeth rather thick, compressed tuberculate and somewhat raised; anterior cicatrices confluent, rather large and moderately well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices concealed within the cavity of the beaks; cavity of the shell very deep and rounded; cavity of the beaks rather deep and angular; nacre pearly white and very iridescent.

Soft parts.—*Branchial uterus* occupies nearly the whole width of the inner branchiæ, the ovisacks being closely approximate and filled with very minute round ova, not sufficiently advanced to give any idea of the form of the embryonic shell.

Ova were also found in the ovaries. *Branchiæ* very large and curved below, the inner ones being very much the larger, united the whole length of the abdominal sack. *Palpi* rather small, thick, rounded below and united only at the upper part. *Mantle* rather thick, much thickened at the edges, having only a few papillæ below the branchial opening. *Branchial opening* large, brownish, with numerous, regular very small papillæ on the inner edges, the papillæ in this alcoholic specimen having more the appearance of closely-placed knobs, which decrease in size below. *Anal opening* very long, without any papillæ and entirely disunited from the branchial opening below, while the anal tube and vent nearly protrude beyond the edges of the mantle. Has no *super-anal opening.* The anterior and posterior adductor muscles are remarkably large, and the abdominal mass is large, compressed and rounded behind. Color of the mass dirty white.

Remarks.—Two specimens only were received; one, a female, in alcohol, from which a careful description of the soft parts is made. Mr. D'Orbigny, in describing his genus *Monocondylœa,* says the soft parts are the same with the *Unio,* but this is not exactly the case. I have seen no *Unio,* or other genus of this family, with the same kind of knob-like papillæ, nor with an anal opening exactly like that described above. In the outline of the hard parts, or outward covering of this species, it is nearest to *Paraguayana,* D'Orb., but may be distinguished from it by its darker color of epidermis and its flatness over the umbones, *Paraguayana* being more inflated there than usual in the genus. Mr. D'Orbigny does not mention that any of the species which he described had undulations of any kind. Nearly all the specimens of the genus which I have seen are eroded at the beaks, except three young ones which I have of two different species, *Parchappii,* D'Orb., and *Franciscana,* Mori. These exhibit no appearance of undulations, while all the numerous species of *Unio* which I have seen from South America have divergent folds at the tips. The border without pearly nacre is very broad in this species. I have great pleasure in naming this interesting species after Don Patricio Maria Paz y Membiela, Commodore in the Royal Spanish Navy, who has aided me greatly in developing the South American *Unionidæ.*

ANODONTA PAZII. Pl. 36, fig. 87.

Testa lævi, subrotunda, valde inflata, inæquilaterali, postice et antice rotundata; valvulis crassiusculis; natibus subprominentibus, acuminatis; epidermide tenebroso-rufo-fusca, eradiata, striata; margarita punicea formosissime iridescente.

Shell smooth, subrotund, very much inflated, inequilateral, rounded before and behind; valves somewhat thick; beaks rather prominent, acuminate; epidermis dark reddish-brown, striate; nacre deep red and most beautifully iridescent.

Proc. Acad. Nat. Sci. 1866, p. 35.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz and C. M. Wheatley.

Diam. 1·1, Length 1·7, Breadth 2·3 inches.

Shell smooth, nearly round, very much inflated, inequilateral, rounded before and behind; substance of the shell somewhat thick; beaks somewhat prominent and pointed at the tips; ligament very small and dark brown; epidermis dark reddish-brown, rather roughly striate, with distant marks of growth and without rays; umbonial slope rounded and rather inflated; posterior slope elliptical, very slightly carinate, with an obscure slightly impressed line from the beaks to the posterior margin; anterior cicatrices confluent, rather large and slightly impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices imperceptible; cavity of the shell deep and rounded; cavity of the beaks shallow and subangular; nacre very deep red and most beautifully iridescent.

Soft Parts.—Two males. *Branchia* rather large, rounded below, inner one somewhat the larger, united the whole length of the abdominal sack. *Palpi* rather large, round and united only at the upper part. *Mantle* thin, much thickened at the edges, with numerous small papillæ below the branchial opening. *Branchial opening* rather small, with a few small dark brown papillæ on the inner edges. *Anal opening* dark brown, corrugated on the edges and very long, entirely disunited from the branchial opening below. Has no super-anal opening. Color of the mass dirty-white.

Remarks.—This very beautiful species has the most intensely red color of the nacre of any species which I have seen. It is almost of a beet-red, and on the broad border this is so intense that in some specimens it is almost black. The border is nearly as large as that of *lato-marginata,* and along the line of junction with the pearly nacre the color is deepened. In outline it is between *rubicunda* and *lato-marginata* (nobis), but is not *obovate* like the latter, nor so round or carinate as the former, and in color much more deeply colored than any I have seen of either of them. In thickness it stands between them. The high wing-like carina of *rubicunda* at once distinguishes that species, and the broad thick margin of *lato-marginata* cannot be confounded with this species.

MYCETOPUS PYGMÆUS = *Anodonta pygmæa,* Spix. Test. Braz. pl. 23, fig 3 and 4.

Soft Parts.—A male. *Branchia* very wide, slightly curved below, inner ones much the larger, united the whole length of abdominal sack. *Palpi* large, round below and united only at the upper part. *Mantle* very thin, slightly thickened at the edges, having no papillæ below the branchial opening. *Branchial opening* rather large, with rather large dark papillæ on the inner edges. *Anal opening* corrugated on the inner edges, very long, entirely disunited from the branchial opening below. Has no *super-anal opening.* Color of the mass pale salmon. The foot has very much the appearance of that of *Mycetopus,* described and figured by D'Orbigny in his Voy. Am. Merid., but the muscular fibre in the single specimen before me is very much contracted by the alcohol.

Hab.—South America, Don Patricio M. Paz.

My cabinet and cabinet of Don P. M. Paz.

Remarks.—A single specimen with the soft parts was received. The outer or hard parts measure 4½ inches in width. Specimens which I have had a long time in my cabinet from Central America are three inches wide. That figured in Spix's Test. Braz. measures 1·6 inches, of course quite a young specimen. This has created some confusion, and induced Dr. Wagner to consider that *Anodonta siliquosa,* Spix, and *An. pygmœa,* Spix, were the same. But I am now satisfied that they are distinct species, and both belong to D'Orbigny's genus *Mycetopus,* which he describes as perforating the earth like *Pholades,* below the water, and which corresponds with the habits of our *Margaritana dehiscens,* Say, = *M. oriens,* Lea, being rarely found except in such holes.

It is to be regretted that the only specimen received should have proved to be a male, as the form of the branchial uterus, as well as that of the embryonic shell, would have been of great interest. M. D'Orbigny does not seem to have observed these forms, as he does not mention them in his description of *Mycetopus,* which does not differ much from *Unio.*

UNIO JEWETTII. Pl. 37, fig. 89.

Testa lævi, oblonga, subinflata, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis subtenuibus; natibus prominulis, ad apices concentrico-undulatis; epidermide fusca; dentibus cardinalibus parvis, obliquis, compressis; lateralibus prælongis lamellatisque; margarita alba et iridescente.

Shell smooth, oblong, rather inflated, very inequilateral, obtusely angular behind, rounded before; valves rather thin; beaks a little prominent, concentrically undulate at the tips; epidermis brownish; cardinal teeth small, oblique and compressed; lateral teeth very long and lamellar; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1867, p. 81.

Hab.—Sink of Noonan's Lake, Florida, Col. E. Jewett.

My cabinet and cabinets of Col. Jewett and Dr. Lewis.

Diam. ·7, Length 1·1, Breadth 1·9 inch.

Shell smooth, oblong, somewhat inflated, inequilateral, obtusely angular behind, rounded before; substance of the shell rather thin; beaks a little prominent, concentrically undulate at the tips; ligament long and thin; epidermis brownish, obscurely rayed and with distant marks of growth; umbonial slope flattened; posterior slope carinate, with two impressed lines in each valve; cardinal teeth small, oblique and compressed, single in the right and double in the left valve; lateral teeth very long, lamellar and slightly curved; anterior cicatrices confluent, large and slightly impressed; posterior cicatrices confluent, very large and very slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell wide and shallow; cavity of the beaks shallow and wide; nacre white and iridescent.

Remarks.—Two rather young specimens of this species were sent to me by Dr. Lewis, of Mohawk, N. Y., to whom they were given by Col. Jewett, of Utica, N. Y., who collected them in Florida. The species is nearly allied to *obesus* (nobis). It seems to be distinct, from the fact of its being wider in proportion and in being more compressed. The beaks of these specimens are eroded, but there is enough of the undulations visible to assure us of the group to which the species belongs.

UNIO BISSELIANUS. Pl. 37, fig. 90.

Testa lævi, oblonga, sublenticulari, inæquilaterali, postice obtuso-angulata, antice rotunda; valvulis subcrassis, antice aliquanto crassioribus; natibus prominulis, ad apices concentrico-undulatis; epidermide tenebroso-oliva, obsolete radiata; dentibus cardinalibus crassiusculis, compressis, subelevatis crenulatisque; lateralibus sublongis, lamellatis subcurvisque; margarita carnea et valde iridescente.

Shell smooth, oblong, sublenticular, inequivalve, obtusely angular behind, round before; valves rather thick, somewhat thicker before; beaks a little prominent, concentrically undulate at the tips; epidermis dark olive, obscurely radiate; cardinal teeth oblique, compressed, somewhat raised; lateral teeth rather long, lamellar and somewhat curved; nacre flesh color and very iridescent.

Proc. Acad. Nat. Sci. 1867, p. 81.

Hab.—Bissel's Pond, Charlotte, N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·9, Length 1·6, Breadth 2·7 inches.

Shell smooth, oblong, sublenticular, inequivalve, obtusely angular behind, round before; substance of the shell thick, somewhat thicker before; beaks a little prominent, concentrically undulate at the tips; ligament rather long and thin; epidermis dark olive, obscurely radiate, with rather close marks of growth; umbonial slope flattish and somewhat darkened; posterior slope carinate and furnished with two impressed lines in each valve; cardinal teeth oblique, compressed, somewhat raised, single in the right and double in the left valve; lateral teeth rather long, lamellar and somewhat curved; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed across the cavity of the beaks; cavity of the shell wide and somewhat deep; nacre flesh color and very iridescent.

Remarks.—This species belongs to the *obesus* group, and has nearly the same outline as *obesus* and it has the same concentric folds at the beaks. The epidermis is of the same color. All the specimens I have seen have the same color of nacre, whitish in the cavity and a lively flesh or pinkish color towards the margin. The umbonial slope has usually a dark, broad, greenish ray and the posterior slope has usually two smaller ones. I am under obligations to Mr. Wheatley for a very beautiful suite.

UNIO CLINCHENSIS. Pl. 37, fig. 91.

Testa lævi, triangulari, ad latere planulata, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassis, antice crassioribus; natibus prominentibus; epidermide luteola, ad latere radiata; dentibus cardinalibus crassis, subcompressis corrugatisque; lateralibus percrassis, curtis obliquisque; margarita alba et iridescente.

Shell smooth, triangular, flattened at the sides, very inequilateral, obtusely angular behind, rounded before; valves thick, thicker before; beaks prominent; epidermis yellowish, radiated on the sides; cardinal teeth thick, rather compressed and corrugate; lateral teeth very thick, short and oblique; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1867, p. 81.

Hab.—Clinch River, Tenn., Pres. Estabrook; French Broad River and Holston River, Tenn., Dr. Edgar.

My cabinet.

Diam. ·8, Length 1·5, Breadth 1·8 inch.

Shell smooth, triangular, flattened at the sides, very inequilateral, obtusely angular behind, rounded before; substance of the shell thick, thicker before; beaks prominent; ligament short and rather thick; epidermis yellowish, with interrupted rays on the sides and with close marks of growth; umbonial slope slightly angular; posterior slope elliptical and slightly raised, usually without rays; cardinal teeth thick, rather compressed, corrugate and double in both valves; lateral teeth very thick, short and oblique; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed on the under side of the plate, within the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks rather deep and subangular; nacre white and iridescent.

Remarks.—I have six specimens before me, all of which are from the upper tributaries of the Tennessee River. In outline it is near to *cuneolus* (nobis), but it is more oblique than that species. There is very little difference in the form of these six specimens. All of them are more or less rayed on the sides. These rays are all interrupted by the lines of growth and are much larger before the umbonial slope, the smaller ones reaching but a short distance from the beaks.

Unio evitatus. Pl. 38, fig. 92.

Testa lævi, elliptica, valde inæquilaterali, postice subbiangulata, antice rotundata; valvulis subtenuibus, antice parum crassioribus; natibus prominulis, ad apices divaricate undulatis; epidermide olivacea, obsolete radiata; dentibus cardinalibus parviusculis, compressis, in utroque valvulo duplicibus; lateralibus sublongis, subrectis lamellatisque; margarita alba et iridescente.

Shell smooth, elliptical, very inequilateral, subbiangular behind, rounded before; valves rather thin, slightly thicker before; beaks a little prominent, divaricately folded at the tips; epidermis olivaceous, obscurely rayed; cardinal teeth rather small, compressed and double in both valves; lateral teeth rather long, nearly straight and lamellar; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Bengal, W. A. Haines.

My cabinet and cabinet of W. A. Haines.

Diam. ·5, Length ·8, Breadth 1·5 inch.

Shell smooth, elliptical, very inequilateral, subbiangular behind and rounded before; substance of the shell rather thin, slightly thicker before; beaks a little prominent, divaricately folded at the tips; ligament thin and light brown; epidermis olivaceous, darker behind and obscurely rayed; umbonial slope slightly raised and obtusely angular; posterior slope narrow elliptical, very slightly carinate, with three green rays in each valve; cardinal teeth small, compressed and double in both valves; lateral teeth rather long, nearly straight, lamellar, single in the right and double in the left valve; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and very indistinct; dorsal cicatrices placed immediately over the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks small and subangular; nacre white and iridescent.

Remarks.—Two specimens are before me, one of which is smoother than the other, and differs slightly in outline. It belongs to the group of which *cæruleus* (nobis) may be considered the type, and stands between that species and *pilatus*, herein described.

It differs from *cæruleus* in being smaller, in not having a bluish epidermis and in the cardinal teeth being stouter. From *pilatus* it differs in being thinner, flatter and less green. In the lateral teeth they are entirely different, *pilatus* being disposed to be *treble in both valves*, while *evitatus* is single in the right and double in the left valve. These two last mentioned shells have been in my possession several years, and I have avoided describing them in the hope of getting others more closely to compare them.

Unio Siamensis. Pl. 38, fig. 93.

Testa lævi, transversa, subcylindracea, ad basim emarginata, valde inæquilaterali, subcompressa, ad latere planulata, postice truncata, antice rotundata; valvulis tenuissimis, diaphinis; natibus prominulis; epidermide luteo-oliva; dentibus cardinalibus acicularis, sublongis, obliquis; lateralibus longis, lamellatis subrectisque; margarita alba et iridescente.

Shell smooth, transverse, subcylindrical, emarginate at the base, very inequilateral, somewhat compressed, flattened at the sides, truncate behind, rounded before; valves very thin, semitransparent; beaks a little prominent; epidermis yellowish olive; cardinal teeth acicular, rather long and oblique; lateral teeth long, lamellar and nearly straight; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Siam, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·5, Length 1·1, Breadth 2·3 inches.

Shell smooth, transverse, subcylindrical, emarginate at the base, very inequilateral, somewhat compressed, flattened at the sides, truncate behind, rounded before; substance of the shell very thin, semitranslucent; beaks small, somewhat pointed and a little prominent; ligament very thin and light brown; epidermis yellowish olive, without rays or obscurely rayed and with distant marks of growth; umbonial slope slightly raised and rounded; posterior slope narrow elliptical, with a rather high carina; cardinal teeth acicular, rather long and oblique; lateral teeth long, lamellar and nearly straight; anterior cicatrices confluent and very slightly impressed; posterior cicatrices confluent and scarcely perceptible; dorsal cicatrices placed directly over the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks very shallow; nacre white, inclining to yellow and very iridescent.

Remarks.—Mr. Wheatley kindly sent me his three specimens for examination and description. The largest, 2¼ inches wide, is evidently mature—the other two are younger. It is a very thin, delicate species, with very remarkably thin, slender, cardinal teeth. The lateral teeth are also thin and long, and in the left valve there is a disposition to have a triple termination. In outline this species is almost identical with *Poeyanus* (nobis) from Mexico, but that is a much thicker shell and has very different cardinal teeth. In the youngest specimen before me the elevated carina is greenish and has a few obscure rays. In outline it is quite different from *Peguensis*, Anth., being much more transverse.

UNIO ASPERULUS. Pl. 38, fig. 94.

Testa plicata, elliptica, inæquilaterali, postice subbiangulata, antice rotundata; valvulis subtenuibus; natibus subprominentibus, ad apices undulatis; epidermide viridi-oliva, obsolete radiata; dentibus cardinalibus lamellatis, parum obliquis, in dextro duplicibus; lateralibus sublongis, lamellatis subcurvisque; margarita cæruleo et valde iridescente.

Shell plicate, elliptical, inequilateral, subbiangular behind, rounded before; valves rather thin; beaks a little prominent, folded at the tips; epidermis olive-green, obscurely rayed; cardinal teeth lamellar, somewhat oblique, double in the right valve; lateral teeth rather long, lamellar and somewhat curved; nacre bluish and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Siam, Thomas R. Ingalls, M.D.

My cabinet.

Diam. ·7, Length ·9, Breadth 1·6 inch.

Shell plicate, elliptical, inequilateral, somewhat biangular behind, rounded before; substance of the shell rather thin; beaks a little prominent, folded at the tips; ligament short, thin and light brown; epidermis olive-green, shining, obscurely rayed and with rather distant marks of growth; umbonial slope obtusely angular; posterior slope narrow elliptical, with a slight carina and three green rays on each valve, the upper one being obscure; cardinal teeth lamellar, somewhat oblique, double in the right and single in the left valve; lateral teeth rather long, lamellar and somewhat curved; anterior cicatrices confluent, rather large and very slightly impressed; posterior cicatrices confluent, large and scarcely perceptible; dorsal cicatrices placed immediately over the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather deep and angular; nacre bluish and very iridescent.

Remarks.—This is a small species which the late Dr. Ingalls sent me some years since. In outline it stands between *cœruleus* and *contradens* (nobis), but is rather shorter and stouter than either. The three specimens before me have a few irregular undulations on the sides and some rather obscure ones on the posterior slope, which distinguish it at once from the two above-mentioned species. In two of the species the undulations are apparent on the inside. Other specimens very probably will be found to be more plicate. Like the two cited species above, the cardinal teeth are *double* in the right valve and single in the left. It is evident that the tips of the beaks are furnished with folds, but they are too much eroded to make them out satisfactorily. It cannot be confounded with *Shurtleffianus* (nobis), which is much wider, more cylindrical, more plicate and very much rougher.

UNIO PILATUS. Pl. 38, fig. 95.

Testa lævi, elliptica, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, ad apices minute undulatis; epidermide luteo-viridi, micanti, obsolete radiata; dentibus cardinalibus subcrassis, curtis, compressis, crenulatis, in utroque valvulo duplicibus; lateralibus sublongis, subrectis lamellatisque; margarita alba et valde iridescente.

Shell smooth, elliptical, very inequilateral, obtusely angular behind, rounded before; valves somewhat thick, thicker before; beaks rather prominent, minutely undulate at the tips; epidermis yellowish-green, shining, obscurely rayed; cardinal teeth somewhat thick, short, compressed, crenulate, double in both valves; lateral teeth rather long, nearly straight and lamellar; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Siam, Thomas R. Ingalls, M.D.

My cabinet.

Diam. ·5,	Length ·8,	Breadth 1·4 inch.

Shell smooth, elliptical, very inequilateral, obtusely angular behind, rounded before; substance of the shell somewhat thick, thicker before; beaks rather prominent, minutely undulate at the tips; ligament short, thin and light brown; epidermis yellowish-green, green prevailing on the posterior half, shining, obscurely rayed, with broad distant marks of growth; umbonial slope obtusely angular and somewhat raised; posterior slope narrow elliptical, with two green rays on each valve; cardinal teeth somewhat thick, short, compressed, crenulate, double in both valves; lateral teeth rather long, nearly straight, lamellar, disposed to be *treble in both valves;* anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, slightly impressed and large; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather deep and angular; nacre pearly-white and very iridescent.

Remarks.—A single specimen only was received from the late Dr. Ingalls. In outline it is near to *cœruleus* (nobis), but differs in being a smaller and thicker species, as well as in having a smoother and greener epidermis. The cardinal teeth are also thicker and shorter. In the lateral teeth they are entirely different, the specimen before me having three nearly perfect ones in both valves. Whether this be a constant character can only be proved by the examination of other specimens. This specimen came with *asperulus,* herein described, and is about the size and has somewhat the same appearance; but that shell is more elliptical, has lamellar cardinal teeth, and is furnished with obscure folds, while *pilatus* is perfectly smooth. The tips of the beaks of this specimen are eroded, but the small closely-placed folds are visible all around the eroded parts, and indicate that they commenced at the very point.

UNIO RUFOFUSCUS. Pl. 39, fig, 96.

Testa plicata, subquadrata, subsulcata, sublenticulari, inæquilaterali, postice rotundata, antice rotunda; valvulis crassiusculis, antice crassioribus; natibus prominulis, crebre et minute plicatis; epidermide rufo-fusca, eradiata, micanti; dentibus cardinalibus subcompressis, obliquis, crenulatis, in utroque valvulo subduplicibus; lateralibus longis subcurvisque; margarita alba et iridescente.

Shell plicate, subquadrate, slightly sulcate, sublenticular, inequilateral, rounded behind and round before; valves somewhat thick, thicker before; beaks slightly prominent, minutely and closely plicate; epidermis reddish-brown, without rays, shining; cardinal teeth somewhat compressed, oblique, crenulate, slightly double in both valves; lateral teeth long and somewhat curved; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1865, p. 76.

Hab.— Don Patricio Maria Paz.

Cabinet of Don P. M. Paz, Madrid.

Diam. ·7, Length 1·2, Breadth 1·7 inch.

Shell plicate, subquadrate, slightly sulcate, sublenticular, inequilateral, rounded behind and round before; substance of the shell somewhat thick, thicker before; beaks slightly prominent, minutely and closely plicate, almost granulate; ligament long, thin and dark brown; epidermis reddish-brown, without rays, shining, with distant marks of growth; umbonial slope very slightly raised and rounded; posterior slope carinate, almost alate; cardinal teeth somewhat compressed, crenulate, double in the right and slightly double in the left valve; lateral teeth long, somewhat curved and corrugate; anterior cicatrices distinct and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre white and iridescent.

Remarks.—A single specimen only is before me. Its habitat is unknown, but it is probably from South America. The epidermis and minute folds are very much like *ellipticus* (nobis) from Brazil. While in these characters it closely resembles *ellipticus*, the outline of the shell is entirely different, being quadrate, more inflated and having a carina almost amounting to a wing. While *rufofuscus* belongs to the quadrate division, *ellipticus* belongs to the wide group. The beaks of the specimen being eroded for some distance, their character cannot be described, but I suspect that the small folds, which reach one-third down the side, will be found in perfect specimens to decrease to the apex.

UNIO WRIGHTII.* Pl. 39, fig. 97.

Testa plicata, lata, ad umbones inflata, valde inæquilaterali, postice acuto-angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus et crebre plicatis; epider-

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* "In a paper on 'Chinese Shells,' by Dr. Baird and Mr. H. Adams, published in the Proceedings of the Zoological Society of London, May 9th, 1867, there are some remarks and claims which call upon me for correction.

"1st, '*Unio Douglasiæ.*' It is stated that 'in 1833 Dr. Gray shortly described and accurately figured in the 12th volume of Griffith's edition of Cuvier a species of *Unio*, which he called *U. Douglasiæ*,' &c. Further, that 'Mr. Lea, some years afterwards, from not knowing the shell as figured in Griffith, described and figured a species from China, which he named *U. Murchisonianus*, but which there is no doubt is the same as *U. Douglasiæ* of Gray.' In the above statements there are several to which I beg leave to demur. It is

mide tenebroso-fusca, eradiata, marginata; dentibus cardinalibus sublongis, subobliquis, crenulatis, lamellatis, in utroque valvulo duplicibus; lateralibus prælongis, obliquis, lamellatis corrugatisque; margarita alba et valde iridescente.

Shell plicate, wide, inflated towards the beaks, very inequilateral, acutely angular behind and rounded before; valves rather thick, thicker before; beaks rather prominent and slightly plicate; epidermis dark brown, without rays, bordered; cardinal teeth rather long, somewhat oblique, crenulate, lamellar and double in both valves;

suggested by these gentlemen that, 'perhaps from not knowing the shell (*Douglasiæ*) as figured in Griffith,' I had 'described and figured *Murchisonianus*, which there is no doubt is the *Douglasiæ* of Gray.' In answer to this I would ask how I could, when I read my paper on the 16th March, 1832, before the American Philosophical Society, know of a description in Griffith's Cuvier dated 1834 (not in 1833, as incorrectly cited)? *Douglasiæ* therefore cannot have precedence 'of some years,' as claimed for it, but it must remain a synonym to *Murchisonianus*, where I placed it in my *Synopsis*, first, second, and third editions, since 1836.

"As regards the claim in the same paragraph for *U. Shanghaiensis*, Lea, being also a synonym to *Douglasiæ*, I am constrained to differ in opinion. *Shanghaiensis* is not the same with *Douglasiæ*, as affirmed, but it is the same with *U. Osbeckii*, Philippi, the description of which I had not seen. 'Conchylien, vol. 3d.' Some years since I placed it as a synonym to *Osbeckii* in the manuscript copy of my Synopsis, 4th edition, preparing for the press.

"2d. *Anodonta tenuis*, Gray,—also called *Unio tenuis*, Gray, in Griffith's Cuvier,—is considered to be, by Messrs. Baird and Adams, an *Anodonta*, and it is said to be little known. This shell does not belong to either of these genera. It is a true *Dipsas* of Leach, and if Dr. Gray had had a perfect specimen before him when describing *Anodonta tenuis*, he never would have placed it in that genus. The *Dipsasian* character was evidently obliterated by age in the specimen from which he made his diagnosis. The young specimens, and the mature perfect ones, always have the tooth (so to call it) of the genus *Dipsas*. I described this species in the Transactions of the American Philosophical Society, March 15th, 1833, under the name of *Symphynota discoidea*, with a figure perfectly representing the characteristic tooth, which consists of a single raised, slightly curved line under the dorsal margin. In my 'Synopsis,' in the first edition in 1836, as well as in the second and third editions, I gave Dr. Gray's *tenuis* as a synonym to this shell, which I there placed in the genus *Dipsas*, where it properly belongs. It must therefore stand as *Dipsas discoidea*, Lea, with the synonym of *Anodonta tenuis*, Gray; my date being 1833, and Dr. Gray's 1834.

"In this paper of Messrs. Baird and Adams, they have described a supposed new species from Shanghai, under the name of *Unio* (Lampsilis) *subtortus*. I previously published a description of a species which I believe will prove the same, under the name of *tortuosus*, in the Proc. Acad. Nat. Sci. April 18, 1865. Since then I have found in the 'Journal de Conchiliologie,' July, 1863,—which work for that year was not accessible to me,—that Messrs. Crosse and Debeaux had given a description and an excellent figure of a *Unio* of the same twisted character, under the name of *Tientsinensis*, which, if the figure be entirely correct, differs in the form of the posterior slope, and in the undulations of that part.

"I may be permitted to express my surprise that neither the French nor the English authors should have observed the very remarkable character of these Chinese species, which were before them, in being *inequivalve!* The figure in the *Journal de Conchyliologie* seems to be very correctly delineated by the artist, having represented the *inequivalve* condition of the right and left valves.

"Messrs. Baird and Adams refer to *Tientsinensis*, but consider it to differ in some respects from their *subtortus*. which I think very likely. If *Tientsinensis* prove to be the same as *tortuosus* and *subtortus*, then the two last must be synonyms. If not, then there will be two species, viz.: *Tientsinensis*, Grosse and Debeaux, and *tortuosus* (nobis),—*subtortus*, B. and A., being a synonym to *tortuosus*."—(*Proc. Acad. Nat. Sci. April*, 1868.)

lateral teeth very long, oblique, lamellar and corrugate; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 75.

Hab.—China, A. R. Wright, M. D.

My cabinet and cabinet of Buffalo Society of Natural History, New York.

Diam. ·9, Length 1·3, Breadth 2·5 inches.

Shell plicate, wide, inflated towards the beaks, very inequilateral, acutely angular behind and rounded before; substance of the shell rather thick, thicker before; beaks rather prominent, furnished with small corrugate folds, some of which assume an angular form; ligament rather long, rather thick and light brown; epidermis dark brown, without rays, with distant marks of growth and with a narrow border of lighter brown; umbonial slope obtusely angular; posterior slope narrow-elliptic, with a few imperfect undulations; cardinal teeth rather long, somewhat oblique, crenulate, lamellar and double in both valves; lateral teeth very long, oblique, lamellar and corrugate; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell wide and rather deep; cavity of the beaks rather deep and subangular; nacre white and very iridescent.

Remarks.—Two specimens of this species were sent for my examination by the Buffalo Society of Natural History, New York. It belongs to the group of which *Murchisonianus* (nobis) may be considered the type. It is more inflated, rather larger and has a less number of undulations. It differs from *Osbeckii*, Phili. = *Shanghaiensis* (nobis) in being more oblique, and not being cylindrical. It reminds one of *U. Pazii* (nobis), also from China, but that shell is not plicate and is more oblique. It is, in outline, near to *Dunkerii* (nobis) from New Granada, but that is a thinner and more transverse shell, with the South American character of radiating folds, which no Asiatic or North American species has, to my knowledge. In outline it is certainly very nearly the same as *U. tumidus*, Retz., common to most parts of Europe. The description is made from a very perfect specimen. The second one is quite imperfect, being so much eroded as to be devoid of folds. It does not seem to possess the light-colored epidermal margin, and this character may not be permanent. I name it after Dr. Wright, who has deposited, in the cabinet of the Buffalo Society of Natural History, a number of fine shells from the fresh waters of China, among which is a gigantic specimen of *U. Cumingii* (nobis), being much larger than I supposed it ever occurred. It has the following dimensions: Diameter 2 inches, length 5½ inches and width 9¼ inches. The wing is entirely gone and the undulations towards the beaks are nearly obliterated.

UNIO TORTUOSUS. Pl. 39, fig. 98.

Testa inæquivalva, contorta, plicata, valde obliqua, inflata, postice obtuse angulata, antice oblique curvata; valvulis percrassis, antice crassioribus; natibus prominentibus, crassis terminalibusque; epidermide tenebroso-oliva, obsolete radiata; dentibus cardinalibus permagnis, crassis, rectis corrugatisque; lateralibus sublongis, subrectis, striis perpendicularis instructis; margarita argentea et valde iridescente.

Shell inequivalve, twisted, plicate, inflated, very oblique, obtusely angular behind and obliquely curved before; valves very thick, thicker before; beaks prominent, thick and terminal; epidermis dark olive, obscurely rayed; cardinal teeth very large, thick, straight and corrugate; lateral teeth rather long, nearly straight and furnished with perpendicular striæ; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci. 1865, p. 76.

Hab.—China, A. R. Wright, M. D.

Cabinet of the Buffalo Society of Natural History, New York.

Diam. 1·1, Length 1·5, Breadth 2·1 inches.

Shell inequivalve, twisted, plicate, very oblique, inflated, obtusely angular behind, obliquely curved before; substance of the shell very thick, thicker before; beaks prominent, thick and terminal; ligament rather short and thin; epidermis dark olive, obscurely rayed and with distant marks of growth; umbonial slope slightly raised and rounded; posterior slope with unequal sides and nearly covered with oblique folds; cardinal teeth very large, thick, straight and corrugate; lateral teeth rather long, nearly straight and furnished with perpendicular, parallel striæ on the upper half; anterior cicatrices distinct and deeply impressed; posterior cicatrices distinct and slightly impressed; dorsal cicatrices placed under the posterior part of the cardinal tooth; cavity of the shell rather deep and rounded; cavity of the beaks very deep and obtusely angular; nacre silver white and very iridescent.

Remarks.—This very remarkable shell was, among other shells from China, sent to me for examination by the Buffalo Society of Natural History. It was accompanied by the gigantic specimen of *U. Cumingii* (nobis) mentioned above. This is the first *Unio* which has been found possessing an irregular plane of the margin and being inequivalve. When looking on the anterior end, with the ligament above, the line of the opening of the valves curves to the right. The beak of the left valve is higher than that of the right and projects anteriorly. The left valve, therefore, is larger than that of the right, and the weight differs—the left being 257 grains and the right 242 grains. In the specimen before me the marks of growth are but two and they are distant. The cardinal teeth are large and nearly in a line with the lateral teeth. The very remarkable perpendicular striæ on the lateral teeth of this specimen, if always present in other individuals, will demand its being placed in the genus *Prisodon*, Schum. = *Castalia*, Lam. These striæ are not so strong and well developed as in *Prisodon ambigua*, Schum., but they are moderately developed and, probably, entirely normal to the species. The apex of the beaks is not perfect in this species, and whether it has undulations or not cannot be ascertained from this specimen, but the oblique undulations on the posterior slope are probably well developed to the points. The epidermis is smooth and glossy, and of so dark an olive as to be nearly bottle-green. In the outline and general appearance one is reminded of *Unio ellipsis* (nobis). Before *Triquetra contorta*, from China, was described by me, none of us could have expected to see a member of the *Unionidæ* to be curved like *Arca tortuosa*, Lin.; but now we have a second member of the family totally unlike the other, except having a curved plane of the shell. Since the above was written I have had two specimens from Hong Kong referred to me by Mr. J. G. Anthony. They have both the same inequivalve character, but they differ in having tubercles on the disks as well as in having folds. The striæ of the lateral teeth are much stronger, thus presenting the character of *Prisodon*. This character, with the tubercles, suggests that this species may be identical with Wood's *Mya nodulosa*, which I have placed in the genus *Prisodon*.

Note.—Since the above description was published in the Pro. Acad. Nat. Sci., April 18th, 1865, I have seen the description of a species by Messrs. Crosse and Debeaux, under the name of *U. Tientsinensis*, in the Journal de Conch., July, 1863. (See note page 285.)

Anodonta Youkanensis. Pl. 40, fig. 99.

Testa lævi, elliptica, valde inflata, valde inæquilaterali, postice subbiangulata, antice rotundata; valvulis subcrassis; natibus prominulis, ad apices aliquanto undulatis; epidermide tenebroso-fusca, eradiata; margarita albida.

Shell smooth, elliptical, very much inflated, very inequilateral, somewhat biangular behind, rounded before; valves somewhat thick; beaks a little prominent, somewhat undulate at the tips; epidermis dark brown, without rays; nacre whitish.

Proc. Acad. Nat. Sci. 1867, p. 81.

Hab.—Upper Youkan River, Arctic America.

My cabinet and cabinet of Smithsonian Institution.

Diam. 1·7, Length 2·5, Breadth 4·9 inches.

Shell smooth, elliptical, very much inflated, very inequilateral, somewhat biangular behind and rounded before; substance of the shell somewhat thick, rather thicker before; beaks a little prominent, somewhat undulate at the tips; ligament very long and narrow; epidermis dark brown, without rays and with very close marks of growth; umbonial slope flattish; posterior slope long ovate and slightly carinate; anterior cicatrices confluent, large and well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed across the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks shallow and wide; nacre whitish.

Remarks.—I am indebeted to Prof. Henry, Secretary of the Smithsonian Institution, for the advantage of seeing and describing this shell, which is the first that has been received from the great river Youkan, of the new territory *Alaska*, recently acquired from Russia in Arctic America. It is greatly to be regretted that other species of the *Unionidæ* have not been found, as they no doubt exist where these were found. I have several specimens before me, all of uniform character.

In outline this species is near to *Anodonta ovata* (nobis), but it is more inequivalve and more inflated, of a darker color in the epidermis and has closer marks of growth. All the specimens received were dead and much injured. I am not aware by whom they were taken and brought here.

ANODONTA GRANADENSIS.* Pl. 41, fig. 100.

Testa lævi, elliptica, subinflata, *inæquivalva*, inæquilaterali, postice obtuse angulata, antice rotunda; valvulis subtenuibus; natibus prominulis; epidermide vel lutea vel virido-radiata; margarita cæruleo-alba et valde iridescente.

Shell smooth, elliptical, somewhat inflated, *inequivalve*, inequilateral, obtusely

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* "In the 'Proceedings of the Acad. of Nat. Sci.,' April, 1856, I described a new species of *Triqueta* (*Hyria*, Lam.), which I called *lanceolata*. It was made from a single valve in a collection from China. In the diagnosis made in the 'Proceedings' it was not mentioned that this valve was somewhat twisted, being fearful that the curved condition arose from accidental circumstances, and not from a normal condition like *Arca tortuosa*, Lin. Subsequently, in the 'Journal of the Academy,' vol. iii, and in 'Observations on the Genus Unio,' vol. vi, I published a full account of this peculiarly interesting species, having received perfect specimens, one of which was well figured. In this paper I thought that, as the original name of *lanceolata*, made from a single imperfect valve, did not apply to the perfect shell, science would be subserved by a descriptive name. I proposed to call it *contorta*, and redescribed it under that name with full remarks and observations. At that time it was the only member of the family *Unionidæ* which was known not to be *equivalve*. Subsequently, in describing a species of *Spatha* under the name of *Natalensis*, I mentioned that it was 'slightly inequivalve.' 'Journal Acad. Nat. Sci.,' vol. vi, and in 'Observations on the Genus Unio,' vol. xi.

"In 1865 I published in the 'Proceedings of the Academy' the diagnosis of a new *Unio* from China, which is *inequivalve* and twisted. This I named *tortuosus*. The full description and figure, with remarks, is in a paper which I have prepared for the Journal of the Academy. These constitute all the *inequivalve* species of the family which I have seen until recently.

"The collection made by the late Mr. Thomas Bridges, botanist, who, during his travels in Central America, visited Lake Nicaragua, has been kindly placed in my possession, part by Col. E. Jewett, and part by Mr. W. M. Gabb, Palæontologist of the California Geological Survey. Very much to my surprise and satisfaction I found that several species of *Unio* and *Anodonta* had this *inequivalve* character.

"It may be here remarked that there seems to be a predisposition, in the *Unionidæ* of Central America, to this very unusual character in the *Unionidæ*, while in Mexico, United States and Canada, where so many species have beee described, there has not been a single one observed. These observations and the followangular behind, round before; valves rather thin; beaks slightly prominent; epidermis yellowish or green rayed; nacre bluish-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 96.

Hab.—Lake Nicaragua, Central America, Col. E. Jewett.

My cabinet and cabinets of Col. Jewett and Academy of Natural Sciences.

Diam. ·6, Length ·9, Breadth 1·4 inch.

Shell smooth, elliptical, somewhat inflated, *inequivalve*, inequilateral, obtusely angular behind, round before; substance of the shell rather thin; beaks slightly prominent; ligament thin and short; epidermis yellowish or green rayed; umbonial slope rounded; posterior slope carinate, elongate elliptical; anterior cicatrices confluent and but little impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices placed in the upper part of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks very shallow; nacre bluish-white and very iridescent.

Remarks.—This species is allied to *lenticularis* and *inæquivalva*, herein described, but may be distinguished by being more transverse than either. The three are very closely allied, but I think they cannot belong to one species. I have been impressed by the fact that, in the *Unionidæ* of Lake Nicaragua, the specific differences are so small that one cannot, with entire satisfaction, seize well defined and characteristic differences, while it is evident they exist.

Anodonta Jewettii Pl. 41, fig. 101.

Testa lævi, suboblonga, valde inflata, parum inæquilaterali, postice rotundata, antice oblique rotundata; valvulis tenuibus; natibus prominentibus, inflatis; epidermide olivacea, transverse striata, fere sulcata, obsolete radiata; margarita argentea et valde iridescente.

Shell smooth, suboblong, very much inflated, somewhat inequilateral, rounded behind and obliquely rounded before; valves thin; beaks prominent, inflated; epidermis olivaceous, transversely striate, almost sulcate and obscurely radiate; nacre silver-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

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ing list will, I hope, induce more attention to the investigation, by students of Fresh-water *Molluscs*, of this interesting branch of inquiry:

List of inequivalve Unionidæ.

Triquetra contorta, China.
Spatha Natalensis, Africa.
Unio tortuosus, China.
Unio Newcombianus, Central America.
Unio Gabbianus, Central America.
Unio encarpus, Central America.
Unio Nicaraguensis, Central America.
Anodonta inæquivalva, Central America.
Anodonta Granadensis, Central America.
Anodonta lenticularis, Central America."

Pro. Acad. Nat. Sci., March, 1868.

Hab.—Lake Nicaragua, Central America, Col. E. Jewett.

My cabinet.

Diam. 1·9, Length 2·5, Breadth 4·3 inches.

Shell smooth, suboblong, very much inflated, somewhat inequilateral, rounded behind and obliquely rounded before; substance of the shell thin; beaks prominent, large and very much inflated; ligament rather short, thick and dark brown; epidermis olivaceous, with a single mark of growth, transversely striate, almost sulcate and obscurely radiate; umbonial slope raised and rounded; posterior slope wide, elliptical and dark green; anterior cicatrices distinct, rather large and very slightly impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed within the cavity of the beaks; cavity of the shell deep and rather wide; cavity of the beaks rather deep and rounded; nacre silver-white, pinkish in the cavity of the beaks and very iridescent

Remarks.—A single specimen was sent to me by Col. Jewett, of Utica, N. Y. It was obtained by him as coming from Lake Nicaragua. The remarks as to habitat mentioned in regard to *An. Bridgesiana*, herein described, may apply to this. In outline and inflation it has a close resemblance to *An. doliaris* (nobis), from North Carolina, but it is more quadrate, has a different epidermis and is much more brilliant in the nacre. The transverse striæ are close and well defined, almost forming furrows. On the posterior slope there are a few broad, greenish rays. The nacre is brilliant, but not nearly so much so as in *Bridgesiana*. The interior, towards the beaks in this specimen, is pinkish. A single mark of growth is prominent towards the margin in this specimen. It cannot be confounded with *Bridgesiana*, from same habitat, that species being more transverse, of a thinner substance and much more brilliant in the nacre, and the dorsal line is not so straight. It differs from *trapezialis*, Lam., in not being oblique, and from *Forbesiana* (nobis) in not being obovate and in not being so solid. I name this fine species after Col. Jewett, who kindly sent it to me.

ANODONTA LENTICULARIS. Pl. 41, fig. 102.

Testa lævi, subrotunda, compressa, *inæquivalva*, inæquilaterali, antice et postice rotundata; valvulis subtenuibus; natibus prominulis; epidermide transverse striata, tenebroso-viridi, redundanter radiata; margarita cæruleo-alba et valde iridescente.

Shell smooth, subrotund, compressed, *inequivalve*, inequilateral, rounded before and behind; valves rather thin; beaks a little prominent; epidermis transversely striate, dark green and very much radiated; nacre bluish-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, W. M. Gabb.

My cabinet.

Diam. ·6,	Length 1,	Breadth 1·4 inch.

Shell smooth, subrotund, compressed, *inequivalve*, inequilateral, rounded before and behind; substance of the shell rather thin; beaks a little prominent; ligament small and pale brown; epidermis transversely striate, dark green and very much radiated; umbonial slope depressed and rounded; posterior slope subcarinate, narrow elliptical; anterior cicatrices confluent and somewhat impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices placed on the upper side of the cavity of the beaks; cavity of the beaks shallow and rounded; cavity of the shell very shallow and subangular; nacre bluish-white and very iridescent.

Remarks.—A single specimen only of this species was received. It is closely allied to *inœquivalva*, herein described, in most of its characters, and especially in being *inequivalve*. It may be distinguished in being more rounded, in being lenticular and in having dark green rays over the whole disk, except on the posterior slope, which is yellow, while the anterior slope is covered with dark green. The nacre is remarkably brilliant. The beaks are eroded and do not seem to possess any undulations.

ANODONTA BRIDGESII. Pl. 42, fig. 104.

Testa lævi, oblonga, inflata, inæquilaterali, antice et postice rotundata; valvulis pertenuibus; natibus prominulis; epidermide lævissima, micante, olivacea, obsolete radiata; margarita elegantissime iridescente.

Shell smooth, oblong, inflated, inequilateral, rounded before and behind; valves very thin; beaks a little prominent; epidermis very smooth, shining, olivaceous and obscurely radiated; nacre elegantly iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Mr. Th. Bridges.

My cabinet and cabinet of the Academy of Natural Sciences.

Diam. 1·7,	Length 2·5,	Breadth 4·7 inches.

Shell smooth, oblong, inflated, inequilateral, rounded before and behind; dorsal and basal margins nearly parallel; substance of the shell very thin; beaks a little prominent; ligament long, thin and light brown; epidermis very smooth, shining, olivaceous, with very distant marks of growth and obscurely radiate; umbonial slope rounded; posterior slope raised almost into a keel, the whole being dark green; anterior cicatrices distinct, very large and very slightly impressed; posterior cicatrices very large and very indistinct; dorsal cicatrices placed within the cavity of the beaks; cavity of the shell large and wide; cavity of the beaks rather shallow; nacre remarkably brilliant and iridescent.

Remarks.—This species of *Anodonta* was among the shells taken by Mr. Bridges, in Nicaragua. Like the other *Unionidæ* brought to this country by some collectors from California, there remains a possibility of error in the habitat. Unfortunately this industrious botanist did not live to bring his collections home, and the *Unionidæ* were sent to San Francisco and there distributed as coming from Lake Nicaragua. Several known species of this collection inhabit Lake Nicaragua, but there are two species of *Micetopus* which heretofore have only been found in South America. This fact, and this only, throws some doubt as to the exact habitat of the species of *Unionidæ*, which have not before been observed. All the *Uniones* received have that peculiar sulcation over the whole disk which characterise all the species I have seen from Lake Nicaragua; and they are by no means rare in our cabinets. But heretofore I have not seen an *Anodonta* from this Lake, while in this collection there are several. All this doubt must be taken into consideration as to the habitat of the species described in this paper said to have come from Lake Nicaragua. The species above described is somewhat like *trapezialis*, Lam., but differs in being more rectangular and having the dorsal and basal lines nearly parallel. There is a disposition in all the specimens before me to be slightly compressed in the middle, from the beaks to the base, which causes a slight arcuation on the basal margin, and on this space there is usually a broad line of slightly darker color. The posterior slope is of a dark green color. The nacre is of most extraordinary brilliancy, radiant with all the colors of the spectrum, being opalescent over the whole interior. I have peculiar gratification in dedicating this fine species to the memory of the distinguished botanist, who, after many years of successful examination of tropical vegetation, was unfortunately unable to return to his family, having died at sea of tropical fever, on his way from Panama to San Francisco. His friend, Dr. Hooker, has honored him by naming a genus of plants after him, calling it *Bridgesia.*

ANODONTA INÆQUIVALVA. Pl. 43, fig. 108.

Testa lævi, obovata, compressa, *inæquivalva*, inæquilaterali, antice et postice rotundata; valvulis subtenuibus; natibus subprominentibus; epidermide vel tenebroso-viridi vel luteo-viridi, obsolete radiata; margarita cæruleo-alba et valde iridescente.

Shell smooth, obovate, compressed, *inequivalve*, inequilateral, rounded before and behind; valves rather thin; beaks somewhat prominent; epidermis dark green or yellowish-green and obscurely radiated; nacre bluish-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Mr. W. M. Gabb.

My cabinet and cabinet of Academy of Natural Sciences.

Diam. ·7, Length 1·1, Breadth 1·6 inch.

Shell smooth, obovate, compressed, *inequivalve*, inequilateral, rounded before and behind; substance of the shell rather thin; beaks somewhat prominent; ligament short, thin and dark brown; epidermis dark green or yellowish-green and obscurely radiated; umbonial slope rather depressed and rounded; posterior slope narrow elliptical and carinate; anterior cicatrices confluent, large and very slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices scarcely perceptible; cavity of the shell rather shallow and wide; cavity of the beaks shallow and obtusely angular; nacre bluish-white and very iridescent.

Remarks.—Several specimens of this remarkable *Anodonta* are before me. They are all slightly *inequivalve*, having the beak of the left valve a little higher than that of the right, and having a slight flexure on the superior anterior margin. In this unusual character of being inequivalve, it resembles *Spatha Natalensis* (nobis), from South Africa, described in my eleventh volume of "Observations on the Genus *Unio*." I have not before observed this character on any of our American *Anodonta*, but we have a *Unio* and a *Triquetra*, it will be remembered, from Northern China, published by me, which are so. To these may now be added several new *Uniones* from Lake Nicaragua, described herein. [See remarks on *U. Nicaraguensis.*] In outline it is near to *luteola* (nobis), but it is a smaller species, thinner and more inflated. Several specimens which accompanied the four before me are nearly of the same size and thinness, but they differ in outline and constitute, I think, different species, and will be described herewith. The epidermis on most of the small *Anodontæ* of this collection is worn and bleached. The one figured has a dark green epidermis, with a broad border. The other three are pale yellow, with obsolete green rays well marked on the posterior slope, with three distinct ones on each valve.

UNIO GRANADENSIS. Pl. 42, fig. 103.

Testa sulca, elliptica, subinflata, inæquilaterali, postice subangulari, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus; epidermide tenebroso-fusca, nigricante, eradiata; dentibus cardinalibus parviusculis, compressis, erectis crenulatisque; lateralibus obliquis; margarita alba et iridescente.

Shell sulcate, elliptical, somewhat inflated, inequilateral, subangular behind, rounded before; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis dark brown, blackish, without rays; cardinal teeth rather small, compressed, erect and crenulate; lateral teeth oblique; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Col. E. Jewett and Mr. Gabb.

My cabinet and cabinets of Acad. Nat. Sci. and Col. Jewett.

Diam. ·6, Length ·9, Breadth 1·4 inch.

Shell sulcate, elliptical, somewhat inflated, inequilateral, subangular behind, rounded before; substance of the shell rather thick, thicker before; beaks somewhat prominent; ligament very short and dark brown; epidermis dark brown, blackish and without rays; umbonial slope obtusely angular; posterior slope narrow and very slightly raised; cardinal teeth rather small, compressed, erect and crenulate; lateral teeth oblique and slightly curved; anterior cicatrices small, distinct and well impressed; posterior cicatrices distinct and moderately well impressed; dorsal cicatrices small, placed on the upper part of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather deep and subangular; nacre white and iridescent.

Remarks.—Nearly a dozen of this small dark-colored species are before me. It is easily distinguished from all the other species from Lake Nicaragua by its nearly black epidermis, which is thin and easily rubbed off. None of the specimens having it to remain on the beaks, and but little on the sides. In some of the specimens there is a disposition to salmon color in the cavity of the beaks. In outline it is nearly the same with *fabalis* (nobis) and *germanus* (nobis). It is also near to *Rowellii* (nobis), from Charges River, and, like it, it is sulcate. It may easily be distinguished from it, however, by the blackish epidermis, the *Rowellii* being of a dark olive. It is also more oblique, and not so large a species.

UNIO ENCARPUS. Pl. 42, fig. 105.

Testa sulcata, subtriangulari, subinflata, aliquanto *inæquivalva*, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis subcrassis, antice crassioribus; natibus prominentibus; epidermide tenebroso-olivacea, encarpiformi, eradiata; dentibus cardinalibus compressis, erectis, crenulatis, in valvulo dextro subtripartitibus; lateralibus obliquis rectisque; margarita albida et iridescente.

Shell sulcate, subtriangular, somewhat inflated, slightly *inequivalve*, inequilateral, obtusely angular behind, rounded before; valves rather thick, thicker before; beaks rather prominent; epidermis dark olivaceous, festoon-like, without rays; cardinal teeth compressed, erect, crenulate, somewhat tripartite in the right valve; lateral teeth oblique and straight; nacre whitish and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Mr. W. M. Gabb.

My cabinet and cabinet of Acad. Nat. Sci.

Diam. ·7, Length ·1, Breadth 1·4 inch.

Shell sulcate, subtriangular, somewhat inflated, slightly *inequivalve*, inequilateral, obtusely angular behind, rounded before; substance of the shell rather thick, thicker before; beaks rather prominent; ligament short and thin; epidermis dark olivaceous, the sulcations being festoon-like, without rays; umbonial slope obtusely angular; posterior slope sulcate, but nearly free from festoons; cardinal teeth compressed, erect, crenulate, somewhat tripartite in the right and double in the left valve; anterior cicatrices distinct and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather deep and angular; nacre whitish and iridescent.

Remarks.—Two specimens only were received, both of the same size, color and form. This species is nearly of the same outline with *U. cyrenoides*, Phil., but differs in not being granulate nor solid, nor quite so deltoid. It cannot be confounded with *Newcombii* (nobis), for that shell is rotund, solid and more compressed. But like the latter it has transverse furrows, which are slightly interrupted by minute and irregular festoon-like curves in the epidermis, and which give the surface a somewhat roughened crinkled aspect. I have given the name *encarpus* to this species from these festoon-like striæ which pervade the disk. The posterior slope has two impressed lines on each valve, and the area within these lines is striate, not sulcate.

UNIO GABBIANUS. Pl. 43, fig. 106.

Testa sulcata, triangulata, subinflata, aliquanto *inæquivalva*, inæquilaterali, postice acute angulari, antice oblique truncata; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominentibus, ad apices retusis; epidermide tenebroso-olivacea, obsolete radiata; dentibus cardinalibus erectis, compressis et valde crenulatis; lateralibus curtis, obliquis striatisque; margarita argentea et iridescente.

Shell sulcate, triangular, somewhat inflated, slightly *inequivalve*, inequilateral, acutely angular behind, obliquely truncate before; valves rather thick, somewhat thicker before; beaks prominent, drawn back at the tips; epidermis dark olive, obscurely radiate; cardinal teeth erect, compressed, and very much crenulate; lateral teeth short, oblique and striate; nacre silver-white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Col. E. Jewett and Mr. W. M. Gabb.

My cabinet and cabinets of Acad. Nat. Sci. and Col. Jewett.

Diam. ·7, Length 1, Breadth 1·3 inch.

Shell sulcate, triangular, somewhat inflated, slightly *inequivalve*, inequilateral, acutely angular behind, obliquely truncate before; substance of the shell rather thick, somewhat thicker before; beaks prominent, drawn back and pointed at the tips; ligament short, thin and light brown; epidermis dark olive, obscurely radiate; umbonial slope obtusely angular; posterior slope very slightly raised, regularly elliptical; cardinal teeth erect, compressed and very much crenulate; lateral teeth short, oblique and striate; anterior cicatrices distinct and well impressed; posterior cicatrices distinct and moderately impressed; dorsal cicatrices placed under the cardinal tooth within the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks deep and angular; nacre silver-white and iridescent.

Remarks.—There are nine specimens before me from Col. Jewett and Mr. Gabb. They are very perfect, having beaks without erosion, but not exhibiting any undulations at the tips, while minute green rays are very apparent. In all the specimens perfect enough the disks exhibit very obscure rays, which are capillary at the apex, and these are beautifully distinct. The furrows are extremely regular and beautiful, and are without festoons as in *encarpus*, herein described. In outline it is near to *cyrenoides*, Phil., but it is a smaller and less solid shell, and the teeth are not massive, but thin, delicate and compressed. I have pleasure in dedicating this pretty little species to Mr. W. M. Gabb, who, while devoting his time to his palæontological duties as one of the geologists of the California Survey, has brought here a number of new species, which were collected by the late botanist Th. Bridges in Lake Nicaragua.

UNIO NICARAGUENSIS. Pl. 43, fig. 107.

Testa sulcata, triangulari, compressa, aliquanto *inæquivalva*, inæquilaterali, postice obtuse angulata, antice oblique truncata; valvulis crassiusculis; natibus prominentibus, subacutis; epidermide olivacea, crebris sulcatis indutis, eradiata; dentibus cardinalibus erectis, compressis, crenulatis et in valvulo dextro subtripartitibus; lateralibus brevibus fornicatisque; margarita argentea et iridescente.

Shell sulcate, triangular, compressed, slightly *inequivalve*, inequilateral, obtusely angular behind, obliquely truncate before; valves rather thick; beaks prominent, rather pointed; epidermis olivaceous, covered with close furrows, without rays; cardinal teeth erect, compressed, crenulate, and in the right valve somewhat tripartite; lateral teeth short and arched; nacre silver-white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 95.

Hab.—Lake Nicaragua, Central America, Mr. W. M. Gabb.

My cabinet and cabinet of Acad. Nat. Sci.

Diam. ·7, Length 1·1, Breadth 1·5 inch.

Shell sulcate, triangular, compressed, slightly *inequivalve*, inequilateral, obtusely angular behind, obliquely truncate before; substance of the shell rather thick; beaks prominent, pointed at the tips; ligament short, thin and light brown; epidermis olivaceous, covered with transverse close furrows and without rays; umbonial slope angular and placed near the posterior margin; posterior slope very narrow elliptical, depressed, with a small elevated line in each valve from the beaks to the posterior margin; cardinal teeth erect, compressed, crenulate, and in the right valve somewhat tripartite; lateral teeth short, lamellar and arched; anterior cicatrices distinct and well impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed in the upper part of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks rather deep and obtusely angular; nacre silver-white and iridescent.

Remarks.—One only of the four specimens before me appears to be adult. This is the most perfect one. The others are apparently only half-grown. This species may be distinguished from *Newcombianus* (nobis) by being less solid, being more compressed, and in having smaller and compressed cardinal teeth. It belongs to the deltoid form of the sulcate group, which group has so many representatives in the Central American *Uniones.* It is somewhat allied in color and sulcation to *Caldwellii* (nobis), but that species is elliptical and the sulcations are not so regular. In the youngest specimen the beaks are nearly perfect. There is no sign of undulations, but there are capillary green rays from the tips. The tripartite character of the cardinal tooth of the right valve is more or less developed in most of these Nicaraguan *Uniones;* some are very slightly so. It is a very remarkable feature of some of the small *Unionidæ* of Lake Nicaragua to be *inequivalve.* Three species described herein are so, plainly showing one beak to be higher than the other, and the plane of the valves may easily be observed to be slightly curved. Having received several perfect specimens of *U. Newcombianus,* I was surprised to find in every case that the *inequivalve* character was also possessed by it.

UNIO BEAVERENSIS. Pl. 44, fig. 109.

Testa lævi, oblonga, compressa, ad latere planulata, inæquilaterali, postice obtuso-biangulari, antice rotunda; valvulis subcrassis, antice parum crassioribus; natibus subprominentibus; epidermide vel rubiginosa vel luteola, micanti, radiata; dentibus cardinalibus crassis sulcatisque; lateralibus longis, crassis, lamellatis subrectisque; margarita vel alba vel purpurea et valde iridescente.

Shell smooth, oblong, compressed, flattened at the sides, inequilateral, obtusely biangular behind, round before; valves rather thick, slightly thicker before; beaks somewhat prominent; epidermis rubiginose or yellowish, shining and obscurely radiate; cardinal teeth thick and sulcate; lateral teeth long, thick, lamellar and nearly straight; nacre white or purple and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Beaver Creek and Long Creek, N. C., C. M. Wheatley, and Carter's Creek, Geo., J. Postell.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·6, Breadth 2·8 inches.

Shell smooth, oblong, compressed, flattened at the sides, inequilateral, obtusely biangular behind, round before; substance of the shell rather thick, slightly thicker before; beaks somewhat prominent; ligament rather short and dark brown;

epidermis reddish-brown or yellowish, shining, radiated, with very distant lines of growth; umbonial slope low and slightly angular; posterior slope very narrow elliptical and raised into a sharp carina, made dark green with rays; cardinal teeth thick, sulcate and slightly crenulate; lateral teeth long, thick, lamellar and nearly straight; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell very shallow and wide; cavity of the beaks very shallow and obtusely angular; nacre white or purple and very iridescent.

Remarks.—Among the *Unionidæ* procured by Mr. Wheatley from North Carolina were several of this species, which belongs to the *complanatus* group. It is allied to *humerosus*, herein described, but is a thicker shell and a little more transverse. The specimen from Carter's Creek, Geo., has a white nacre and may possibly be a different species. The older specimens are dark, reddish-brown and some are without rays. The younger and more perfect specimens are yellowish, and the one figured is covered with fine rays.

UNIO NUBILUS. Pl. 44, fig. 110.

Testa lævi, oblonga, subcompressa, inæquilaterali, postice biangulari, antice rotundata; valvulis crassis, antice crassioribus; natibus prominulis; epidermide tenebroso-fusca, eradiata; dentibus cardinalibus crassis, sulcatis corrugatisque; lateralibus crassis, longis, corrugatis lamellatisque; margarita nubila, salmonea et purpurea, iridescente.

Shell smooth, oblong, subcompressed, inequilateral, biangular behind and rounded before; valves thick, thicker before; beaks a little prominent; epidermis dark brown, eradiate; cardinal teeth thick, sulcate and corrugate; lateral teeth thick, long, corrugate and lamellar; nacre cloudy, salmon colored and purple, iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Paw Creek, Mecklenburg Co., N. C., C. M. Wheatley.

Diam. ·9, Length 1·8, Breadth 3·2 inches.

Shell smooth, oblong, subcompressed, inequilateral, biangular behind and rounded before; substance of the shell thick, thicker before; beaks a little prominent; ligament long, thick and very dark brown; epidermis very dark brown, without rays and with rather close lines of growth; umbonial slope somewhat raised and obtusely angular; posterior slope narrow elliptical, somewhat raised, with rather a wide furrow on each valve from the beaks to the posterior margin; cardinal teeth thick, sulcate and corrugate; lateral teeth thick, long, corrugate and lamellar; anterior cicatrices distinct, very large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and obtusely angular; nacre cloudy, salmon-color and purple, iridescent.

Remarks.—There are four specimens before me, all of which have a mixture of color, salmon, purple and greenish epidermal matter, which gives a singular clouded aspect to the nacre of the interior. Hence the name. The salmon color prevails and is very intense and beautiful in several of the specimens. In outline this species is near to *Weldonensis* and *Mecklenbergensis* (nobis). It is more quadrate than either and differs entirely in the color of the nacre.

UNIO DATUS. Pl. 44, fig. 111.

Testa lævi, lato-elliptica, valde compressa, inæquilaterali, postice obtuse angulari, antice rotundata; valvulis subcrassis, antice parum crassioribus; natibus prominulis; epidermide rufo-fusca, micanti, obsolete radiata; dentibus cardinalibus parviusculis, sulcatis erectisque; lateralibus prelongis, subcurvis, lamellatis corrugatisque; margarita nubila, salmonea et purpurea, et valde iridescente.

Shell smooth, broadly elliptical, very much compressed, inequilateral, obtusely angular behind, rounded before; valves somewhat thick, a little thicker before; beaks slightly prominent; epidermis reddish-brown, shining and obscurely radiated; cardinal teeth rather small, sulcate and erect; lateral teeth very long, somewhat curved, lamellar and corrugate; nacre cloudy, salmon-color and purple, and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Paw Creek, Beaver Co., and Long Creek, N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·7, Breadth 3·2 inches.

Shell smooth, broadly elliptical, very much compressed, inequilateral, obtusely angular behind and rounded before; substance of the shell somewhat thick, a little thicker before; beaks slightly prominent; ligament long, narrow and dark; epidermis reddish-brown, shining, obscurely radiated, with distant distinct lines of growth; umbonial slope flattened; posterior slope slightly carinate; cardinal teeth rather small, sulcate and erect; lateral teeth very long, somewhat curved, lamellar and corrugate; anterior cicatrices distinct, large and well impressed; posterior cicatrices distinct and moderately well impressed; dorsal cicatrices nearly in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow; nacre cloudy, salmon-color and purple, and very iridescent.

Remarks.—Three specimens are before me and they are all of the same regular ellipse. In outline it is very close to *subellipsis* (nobis), and also to some varieties of *radiatus*, Lam., but these totally differ in radiations and color of epidermis. The nacre in all has a predominence of salmon color, but it it is mixed with purple and the deposit of epidermal matter, so that the whole interior of the disk becomes cloudy. The lines of growth in each of the three specimens are four, and they are at nearly equal distances and very strongly marked.

UNIO DORSATUS. Pl. 45, fig. 112.

Testa lævi, triangulari, ad latere planulata, inæquilaterali, postice subbiangulari, antice rotundata; valvulis subtenuibus, antice crassiusculis; natibus prominentibus; epidermide rufo-fusca, subsquamosa, obsolete radiata; dentibus cardinalibus parvis corrugatisque; lateralibus longis, lamellatis subcurvisque; margarita vel alba vel purpurea vel salmonea et valde iridescente.

Shell smooth, triangular, flattened at the sides, inequilateral, subbiangular behind and rounded before; valves rather thin, thicker before; beaks prominent; epidermis reddish-brown, subsquamose, obtusely radiated; cardinal teeth small and corrugate; lateral teeth long, lamellar and somewhat curved; nacre white, purple or salmon color and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 160.

Hab.—Catawba River, N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·9, Length 1·5, Breadth 2·2 inches.

Shell smooth, triangular, flattened at the sides, inequilateral, subbiangular behind, rounded before; substance of the shell rather thin, thicker before; beaks prominent; ligament short, thick and dark brown; epidermis reddish-brown, somewhat squamose, obscurely radiate, with distant lines of growth; umbonial slope raised and obtusely angular; posterior slope raised into a carina; cardinal teeth small and corrugate; lateral teeth long, lamellar and somewhat curved; anterior cicatrices distinct and well impressed; posterior cicatrices confluent and moderately impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather deep and subangular; nacre white, purple or salmon color and very iridescent.

Remarks.—Several specimens are before me which differ slightly. They have all more or less color of purple; some are mixed with salmon color. One is clouded with purple and white. In outline it is nearest to *ovatus*, Say, but it differs very much in size, inflation, color of the nacre, epidermis, and flatness of the posterior slope. The epidermis in *ovatus* is yellowish, smooth and polished. In this species it is rubiginose and squamose. The beaks, as usual in nearly all the specimens sent from this part of North Carolina, are eroded, and therefore the apicial undulations are unknown. Some of the specimens are wrinkled on the posterior slope.

Unio humerosus. Pl. 45, fig. 113.

Testa lævi, elliptico-oblonga, compressa, ad latere planulata, inæquilaterali, postice obtuse biangulari, antice rotunda; valvulis subcrassis, antice crassioribus; natibus prominulis; epidermide rufo-fusca, obsolete radiata; dentibus cardinalibus grandibus, sulcatis, partitis; lateralibus prælongis, lamellatis corrugatisque; margarita salmonis colore tincta et valde iridescente.

Shell smooth, elliptical oblong, compressed, flattened at the side, inequilateral, obtusely biangular behind and round before; valves rather thick, thicker before; epidermis reddish-brown, obsoletely radiated; cardinal teeth large, sulcate and divided; lateral teeth very long, lamellar and corrugate; nacre salmon color and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Charlotte, Mecklenberg Co., N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1·1, Length 2·1, Breadth 3.5 inches.

Shell smooth, elliptical oblong, compressed, flattened at the side, inequilateral, obtusely biangular behind and round before; substance of the shell thick, thicker before; ligament long, large and dark brown; epidermis reddish-brown, obscurely radiated, with somewhat distant marks of growth; umbonial slope flattened and rounded; posterior slope narrow-elliptical, carinate, dark brown, with two impressed lines in each valve; cardinal teeth large, sulcate and divided; lateral teeth very long, lamellar and corrugate; anterior cicatrices distinct, very large and very much impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre salmon colored and very iridescent.

Remarks.—In outline this species is very nearly the same as *Charlottensis* (nobis), but that is a thinner shell, with very different cardinal and lateral teeth, which are very small, while in *humerosus* they are thick and almost massive. The cavity of the shell in the latter is also much more shallow. The color of the nacre is also different. The cardinal teeth of *humerosus* are remarkably sulcate, and disposed to be divided into three parts in each valve. The lateral teeth are large and stout. The whole of the posterior slope is dark, and there are a few thin rays before the umbonial slope. In a younger specimen the rays are over the whole disk. In some respects this species reminds one of *Weldonensis* nobis), but *humerosus* is more quadrate, has larger teeth, and the color is salmon.

UNIO PAWENSIS. Pl. 45, fig. 114.

Testa lævi, suboblonga, inflata, valde inæquilaterali, postice subbiangulari, antice rotundata; valvulis subcrassis; natibus subprominentibus, subtumidis; epidermide tenebroso-fusca, squamosa, eradiata; dentibus cardinalibus parvis, corrugatis, subconicis; lateralibus longis, lamellatis subcurvisque; margarita vel alba vel purpurescente et iridescente.

Shell smooth, suboblong inflated, very inequilateral, subbiangular behind and rounded before; valves rather thick; beaks somewhat prominent and rather swollen; epidermis dark brown, squamose, without rays; cardinal teeth small, corrugate, somewhat conical; lateral teeth lamellar and somewhat curved; nacre white or purplish and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Paw Creek, Beaver Co., and Catawba Run, N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1·2, Length 1·6, Breadth 2·9 inches.

Shell smooth, suboblong, inflated, very inequilateral, subbiangular behind and rounded before; substance of the shell rather thick; beaks somewhat prominent and rather swollen; ligament rather short, thin and dark brown; epidermis dark brown, squamose, without rays, with rather distant lines of growth; umbonial slope very much raised and obtusely angular; posterior slope wide, somewhat carinate, with an impressed line from the beaks to the posterior margin; cardinal teeth small, corrugate and somewhat conical; lateral teeth lamellar and somewhat curved; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks rather deep and wide; nacre white or purplish and iridescent.

Remarks.—Quite a number of specimens were submitted to me by Mr. Wheatley, none of which were perfect enough at the beaks to show any undulations, and all were more or less eroded on the sides. In outline it is allied to *squalidus* (nobis), and is nearest in general characters to that species. It also reminds one of *obesus* (nobis), but it is not so ventricose, and it differs in the epidermis, as well as the teeth.

UNIO MURRAYENSIS. Pl. 46, fig. 115.

Testa lævi, obliqua, tumida, solida, valde inæquilaterali, postice rotundata, antice truncata; valvulis crassis, antice crassioribus; natibus valde elevatis, tumidis; epidermide luteo-fuscata, concentrico-vittata, eradiata; dentibus cardinalibus crassis, subelevatis; lateralibus crassis, obliquis rectisque; margarita argentea et iridescente.

Shell smooth, oblique, swollen, solid, very inequilateral, rounded behind, truncate before; valves thick, thicker before; beaks very much elevated, swollen; epidermis yellowish-brown, concentrically banded, without rays; cardinal teeth thick and somewhat raised; lateral teeth thick, oblique and straight; nacre silver-white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 143.

Hab.—Connesauga Creek, Whitfield Co., Georgia, Major T. C. Downie; Etowah River, Geo., Bishop Elliott.

My cabinet and cabinets of Dr. Lewis and Dr. Hartman.

Diam. ·9, Length 1·2, Breadth 1·4 inch.

Shell smooth, oblique, swollen, solid, very inequilateral, rounded behind, truncate before; substance of the shell thick, thicker before; beaks very much elevated, swollen; ligament short, rather thick and light brown; epidermis yellowish-brown, concentrically and distinctly banded, without rays, and with very close marks of growth; umbonial slope raised and obtusely angular; posterior slope flattened and cordate; cardinal teeth thick and somewhat raised; lateral teeth thick, oblique and straight; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and moderately impressed; dorsal cicatrices placed under the cardinal tooth; cavity of the shell rather shallow and rounded; cavity of the beaks shallow and rounded; nacre silver-white and iridescent.

Remarks.—Among the oblique group of *Uniones* I have had, for many years, a few specimens which I could not satisfactorily place with any species of the group in which there had already been many classed. The entire group so completely inosculate that it is with great difficulty that they can be made out, without complete suites, which few are happy enough to possess. I have had one specimen certainly twenty years. Several were received six years since, and recently, by the kindness of Major Downie, of Georgia, I am in possession of five more. All the specimens I have differ so little, that I am able to satisfy myself of the distinctness of the species. It is most closely allied to *mundus* (nobis), but may be distinguished by being more inflated, being more curved at the basal margin, and in having green bands along the marks of growth, *mundus* having maculate or interrupted rays. It also has the teeth more solid than *mundus*.

UNIO UHARÉENSIS. Pl. 46, fig. 116.

Testa lævi, oblonga, ad latere planulata, inæquilaterali, postice biangulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus prominulis; epidermide rufo-fusca, subsquamea, eradiata; dentibus cardinalibus parvis, striatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subcurvisque; margarita vel alba vel salmonis colore tincta.

Shell smooth, oblong, flattened at the sides, inequilateral, biangular behind and rounded before; valves somewhat thick, thicker before; beaks slightly prominent; epidermis reddish-brown, somewhat squamose, without rays; cardinal teeth small, striate, in both valves double; lateral teeth long, lamellar and somewhat curved; nacre white or salmon color.

Proc. Acad. Nat. Sci. 1868, p. 145.

Hab.—Uharee River, Montgomery Co., N. C., F. A. Genth, M.D.

My cabinet and cabinets of Academy of Natural Sciences and Dr. Genth.

Diam. ·8, Length 1·3, Breadth 2·3 inches.

Shell smooth, oblong, flattened at the sides, biangular behind, rounded before, inequilateral; substance of the shell somewhat thick, thicker before; beaks a little prominent; ligament rather long, dark brown; epidermis reddish-brown, with rather distant marks of growth, without rays, squamose on the anterior and basal margins; umbonial slope obtusely angular; posterior slope slightly carinate; cardinal teeth small, striate, double in both valves, slightly raised and nearly perpendicular; lateral teeth long, lamellar, somewhat thick and slightly curved; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices distinct, large and well impressed; dorsal cicatrices small, and placed above the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks very shallow; nacre white, generally tinted with salmon-color in the cavity of the beaks, iridescent.

Remarks.—Dr. Genth very kindly submitted a number of specimens to my examination. They were of very different ages, but none, even the very young, had beaks perfect enough to observe undulations. It is allied to *salebrosus* (nobis), from Georgia, but none of the specimens I have are so large as those of *salebrosus*. The epidermis is rougher, more rubiginose, more squamose, and has none of the greenish rays which that shell has. It is not so inequilateral; the teeth are very much the same.

UNIO GENUINUS. Pl. 46, fig. 117.

Testa lævi, elliptica, subinflata, inæquilaterali, postice subbiangulata, antice rotundata; valvulis subtenuibus, antice crassioribus; natibus subprominentibus; epidermide luteola, valde radiata; dentibus cardinalibus erectis, pyramidatis; lateralibus longis, subcurvis lamellatisque; margarita alba et iridescente.

Shell smooth, elliptical, somewhat inflated, inequilateral, subbiangular behind, rounded before; valves rather thin, thicker before; beaks somewhat prominent; epidermis yellowish, very much radiated; cardinal teeth erect, pyramidal; lateral teeth long, somewhat curved and lamellar; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—Bissel's Pond, Charlotte, N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·2, Breadth 2 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, subbiangular behind, rounded before; substance of the shell rather thin, thicker before; beaks somewhat prominent; ligament rather long, chestnut-brown color; epidermis yellowish, with numerous green capillary rays on the posterior half, with distant marks of growth; umbonial slope rounded; posterior slope narrow elliptical and slightly carinate; cardinal teeth erect, pyramidal and double in the right and disposed to be treble in the left valve; lateral teeth long, somewhat curved and lamellar; anterior cicatrices confluent, rather small and moderately impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather deep and rounded; nacre white and iridescent.

Remarks.—Mr. Wheatley submitted three specimens of this shell to me. It is so closely allied to *intercedens* and *fallax* (nobis) that I was not disposed to consider it different, until I gave it a complete examination and comparison. It is rather more compressed than either, and is more enlarged over the umbonial slope, where the rays are also more capillary. In all the three specimens the nacre is white, while in the other two species mentioned above it is usually salmon and purple. The beaks are too much eroded to distinguish the undulations.

UNIO FASSINANS. Pl. 47, fig. 118.

Testa lævi, elliptica, subcompressa, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus; epidermide tenebroso-rufo-fusca, eradiata; dentibus cardinalibus crassiusculis, compressis, obliquis; lateralibus sublongis, crassis, obliquis corrugatisque; margarita salmonis colore tincta, splendens et iridescente.

Shell smooth, elliptical, subcompressed, inequilateral, obtusely angular behind, rounded before; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis dark reddish-brown, without rays; cardinal teeth somewhat thick, compressed, oblique; lateral teeth rather long, thick, oblique and corrugate; nacre salmon-colored, splendid and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 143.

Hab.—Head-waters of Holston River, Washington Co., Va., Prof. E. D. Cope.

My cabinet and cabinet of Acad. Nat. Sci.

Diam. ·9, Length 1·5, Breadth 2·3 inches.

Shell smooth, elliptical, somewhat compressed, inequilateral, obtusely angular behind and rounded before; substance of the shell thick, thicker before; beaks somewhat prominent; ligament large and dark brown; epidermis dark reddish-brown, without rays, and with rather close marks of growth; umbonial slope depressed and rounded; posterior slope narrow-elliptical, subcarinate; cardinal teeth somewhat thick, compressed, and oblique; lateral teeth rather long, thick, oblique and corrugate; anterior cicatrices distinct, rather large and deeply impressed; posterior cicatrices distinct, rather large and well impressed; dorsal cicatrices placed on the upper side of the cavity of the shell; cavity of the shell rather shallow and wide; cavity of the beaks rather shallow and obtusely angular; nacre salmon-colored, splendid and iridescent.

Remarks.—I found a single specimen only among the large number of *Unionidæ* brought by Prof. Cope. At first I thought it to be a salmon-colored variety of *Copei*, but while the outline is closely alike, the epidermis and interior are quite different. The cardinal teeth differ in *fassinans*, being more robust and not so compressed; in the lateral teeth being thicker, more solid, and in having that of the right valve disposed to be double. In the nacre all the four specimens of *Copei* are alike in having a very dark purple color, while in *fassinans* the nacre is of a remarkably soft satin-like salmon color. The cavity of *fassinans* is not so deep as that of *Copei*. The beaks of this specimen are eroded, and therefore their character cannot be ascertained.

UNIO SPARUS. Pl. 47, fig. 119.

Testa lævi, lato-elliptica, subinflata, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis subtenuibus, antice crassioribus; natibus prominentibus, ad apices minute undulatis; epidermide subcrocea, valde radiata; dentibus cardinalibus parvis, erectis, conicis; lateralibus longis subcurvisque; margarita salmonis colore tincta et valde iridescente.

Shell smooth, broadly elliptical, somewhat inflated, very inequilateral, obtusely angular behind, rounded before; valves rather thin, thicker before; beaks a little prominent, minutely undulate at tip; epidermis reddish-yellow, very much radiated; cardinal teeth small, erect and conical; lateral teeth long and somewhat curved; nacre salmon-color and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 143.

Hab.—Swamp Creek, Whitfield Co., Georgia, Major T. C. Downie.

My cabinet and cabinets of Maj. Downie, Mr. Wheatley and Dr. Lewis.

Diam. ·7, Length 1·1, Breadth 1·8 inch.

Shell smooth, broadly elliptical, somewhat inflated, very inequilateral, obtusely angular behind and rounded before; substance of the shell rather thin, thicker before; beaks a little prominent, minutely undulate at the tips; ligament short, thin and dark brown; epidermis reddish-yellow, very much radiated, with moderately distant marks of growth; umbonial slope low and rounded; posterior slope narrow elliptical; cardinal teeth small, erect and conical; lateral teeth long, lamellar and somewhat curved; anterior cicatrices distinct, rather small and moderately well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed across the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and obtusely angular; nacre salmon color and very iridescent.

Remarks.—A number of specimens of nearly all ages were sent to me by Major Downie. In the color of the epidermis, as well as in the nacre, this species is nearly allied to *subangulatus* (nobis). In outline it is nearly the same, but *sparus* is rather more transverse, and differs in not having a subangular umbonial slope. It also differs in having smaller rays more closely set, and those more prevalent on the posterior half of the disk. The nacre of *sparus* is perhaps more brilliant. *Sparus* cannot be confounded with *scitulus* (nobis), although the two species are very nearly of the same outline. *Scitulus* is rather heavier and larger, and has a yellow epidermis with green rays, which are generally interrupted by the marks of growth. The nacre of *scitulus* is usually white, with a slight tint of salmon in the cavity of the beaks, while *sparus* is almost always dark salmon in the greater part of the cavity of the shell.

UNIO COPEI. Pl. 47, fig. 120.

Testa lævi, elliptica, subcompressa, inæquilaterali, antice et postice rotundata; valvulis subcrassis, antice crassioribus; natibus prominulis, ad apices undulatis; epidermide tenebroso-fuscata, ad marginem squamosa, eradiata; dentibus cardinalibus subcrassis, elevatis, compressis, corrugatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subcurvatisque; margarita purpurea et valde iridescente.

Shell smooth, elliptical, somewhat compressed, inequilateral, rounded before and behind; valves somewhat thick, thicker before; beaks slightly prominent, undulate at the tips; epidermis dark brown, squamose towards the margin, eradiate; cardinal teeth rather thick, raised, compressed, corrugate and double in both valves; lateral teeth long, lamellar and somewhat curved; nacre purple and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Head-waters of the north branch of the Holston River, Smyth County, Va., Prof. E. D. Cope.

My cabinet and cabinet of the Academy of Natural Sciences.

Diam. ·9, Length 1·6, Breadth 2·3 inches.

Shell smooth, elliptical, somewhat compressed, inequilateral, rounded before and behind; substance of the shell somewhat thick, thicker before; beaks slightly prominent, undulate at the tips; ligament short, thick and dark brown; epidermis dark brown, squamose towards the margin, without rays and with somewhat distant marks of growth; umbonial slope flat and rounded; posterior slope narrow elliptical, slightly carinate, with two slightly impressed lines in each valve from the beaks to the posterior margin; cardinal teeth rather thick, raised, compressed, corrugate and double in both valves; lateral teeth long, lamellar and somewhat curved; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and obtusely angular; nacre purple and very iridescent.

Remarks.—This species is closely allied to *Pybasii* (nobis), but may be distinguished by being larger and of a more regular ellipse. Among the specimens before me two are adults, one of which is figured. They all have a deep purple nacre in the cavity of the shell, the anterior and basal margins near to the edge being white. One of the specimens has a tinge of salmon color towards the basal margin. There are no rays on either of these specimens, except quite a young one, which has obsolete rays; and the tips of the beaks present minute undulations. The inferior posterior cicatrix is larger than usual in proportion to the superior one. It is with great pleasure I name this species after Prof. Cope, who, while exploring the head-waters of the Holston, New and Catawba Rivers for ichthyological purposes, extended his researches to the *Molluscs* of these little-frequented districts, among the mountains of Virginia, North Carolina and Tennessee.

UNIO CYLINDRELLUS. Pl. 48, fig. 121.

Testa lævi, late elliptica, cylindraceâ, valde inæquilaterali, antice et postice rotundata; valvulis subcrassis, antice crassioribus; natibus prominulis; epidermide luteola, eradiata; dentibus cardinalibus parvis, subconicis corrugatisque; lateralibus longis subcurvisque; margarita intus purpurea et valde iridescente.

Shell smooth, widely elliptical, somewhat cylindrical, very inequilateral, rounded before and behind; valves somewhat thick, thicker before; beaks slightly prominent; epidermis yellowish, without rays; cardinal teeth small, subconical, corrugate; lateral teeth long and somewhat curved; nacre purple within and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Duck Creek, Tenn., Swamp Creek, Whitfield Co., Geo., Major Downie, and North Alabama, Prof. Tuomey.

My cabinet.

Diam. ·7, Length ·8, Breadth 1·5 inches.

Shell smooth, widely elliptical, somewhat cylindrical, very inequilateral, rounded before and behind; substance of the shell thick, thicker before; beaks slightly prominent; ligament rather long and thin; epidermis yellowish, without rays, with rather distant marks of growth; umbonial slope rather high and rounded; posterior slope elliptical, low, with a line from the tip to the posterior margin in both valves; cardinal teeth small, subconical and corrugate; lateral teeth long and somewhat curved; anterior cicatrices distinct, small and well impressed; posterior cicatrices distinct, rather small and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the shell; cavity of the shell rather deep and wide; cavity of the beaks rather deep and subangular; nacre purple within the cavity and very iridescent.

Remarks.—I have two specimens and an odd valve of this interesting species before me. These are adults. The thickened margin of the nacre below the palleal impression is white in three specimens. Neither of the specimens have any rays. In outline it is nearly allied to *granulatus* (nobis), and *parvus*, Barnes, but is not easily confounded with either, being more cylindrical than either, being more solid, and in having a yellowish epidermis, while the others are dark greenish.

UNIO BRAZOSENSIS. Pl. 48, fig. 122.

Testa plicata, subrotunda, ventricosa, valde inæquilaterali, antice et postice rotundata; valvulis percrassis, antice crassioribus; natibus prominentibus, tumidis, incurvis, ad apices minute undulatis; epidermide tenebroso-rufo-fusca, eradiata; dentibus cardinalibus percrassis, solidis, erectis corrugatisque; lateralibus longis subcrassis et obliquis; margarita argentea et valde iridescente.

Shell folded, subrotund, ventricose, very inequilateral, rounded before and behind; valves very thick, thicker before; beaks prominent, swollen, incurved and minutely undulate at the tips; epidermis dark reddish-brown, without rays; cardinal teeth very thick, solid, erect and crenulate; lateral teeth long, rather thick and oblique; nacre silver-white and beautifully iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Dallas Co., Texas, Prof. Forshey; Brazos River, Dr. Lincecum.

My cabinet and cabinet of Smithsonian Institution.

Diam. 1·5, Length 2·1, Breadth 2·7 inches.

Shell plicate, subrotund, ventricose, very inequilateral, rounded before and behind; substance of the shell very thick, thicker before; beaks prominent, swollen, incurved and minutely undulate at the tips; ligament very large and light brown; epidermis dark reddish-brown, without rays, with distant broad marks of growth; umbonial slope raised, rounded, with two irregular raised lines from the tips to posterior margin; posterior slope cordate and carinate; cardinal teeth very thick, solid, erect and crenulate; lateral teeth long, rather thick and oblique; anterior cicatrices distinct, rather large, corrugate and well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed over the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks deep and angular; nacre silver-white, with a narrow reddish border beautifully iridescent.

Remarks.—I have nine specimens of this species before me, the youngest of which is about one-fourth grown. Four are from the Brazos River, sent by Dr. Lincecum to the Smithsonian Institution; the others many years since were sent to me by Prof. Forshey. Until I received those collected by Dr. Lincecum, I was not entirely satisfied as to their not being a variety of *plicatus*, Lesueur, to which this species is closely allied. There are, however, several points which distinguish them. *Brazosensis* is a more rounded shell, and is more tumid at the beaks. The color of the epidermis is also very different, being disposed to be of a dark rubiginose color, and where the epidermis is removed, particularly on the beaks, the color is a tint of salmon. The marginal line beyond the nacre is reddish, which is not the case with *plicatus*. The species herein described under the name of *Lincecumii*, which came with it, cannot be confounded with it, for *Lincecumii* is globose and usually has five or six folds, while *Brazosensis* has a few very irregular ones. The marks of growth of *Brazosensis* are few, distant and well-marked, usually being impressed, and thus on the first growth giving it a tumid appearance. On the umbonial and posterior slope there are usually three irregular raised lines, one of which cuts diagonally the folds. The undulations of the tips are few, very small and subconcentric.

UNIO CORVINUS. Pl. 48, fig. 123.

Testa lævi, elliptica, inflata, valde inæquilaterali, antice et postice rotundata; valvulis subcrassis, antice crassioribus; natibus vix prominentibus; epidermide nigra, subsquamea, eradiata; dentibus cardinalibus parvissimis decussatisque; lateralibus longis subrectisque; margarita alba et valde iridescente.

Shell smooth, elliptical, inflated, very inequilateral, rounded before and behind; valves somewhat thick, thicker before; beaks scarcely prominent; epidermis black, subsquamose, without rays; cardinal teeth very small and decussate; lateral teeth long and somewhat straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Flint River, Geo., J. C. Plant and Dr. Neisler; Darien? J. H. Couper; Neuse River, Raleigh, N. C., Prof. Emmons.

My cabinet.

Diam. ·7, Length ·8, Breadth 1·3 inch.

Shell smooth, elliptical, inflated, very inequilateral, rounded before and behind; substance of the shell somewhat thick, thicker before; beaks scarcely prominent;

ligament short, thin and very dark brown; epidermis black, subsquamose, without rays, with close marks of growth; umbonial slope rounded, sometimes with a raised line; posterior slope elliptical, with a slight furrow on each valve from the beaks to the posterior margin; cardinal teeth very small and decussate; lateral teeth long and somewhat straight; anterior cicatrices distinct, small and well impressed; posterior cicatrices confluent, very slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and obtusely angular; nacre white and iridescent.

Remarks.—I have had most of the four specimens of this little black species, now before me, for many years, always doubtful as to whether they might belong to *parvus*, Bar., or to *paulus* (nobis). Now, after a thorough examination and comparison, I am convinced that it cannot belong to either of these two species, and therefore must be considered to be a new one. The group of little shells of which this is a member are all very much alike, while there exists a difference which the practised eye easily analyzes. This species has a well-pronounced angle on the umbonial slope, which is absent on the other species. The epidermis is more rough and blacker than the others. All the four specimens have a pure white nacre, and the beaks of these are all eroded, so that we must remain ignorant if there be any undulations, until perfect specimens are found.

UNIO DIFFICILIS. Pl. 49, fig. 124.

Testa lævi, elliptica, inflata, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis tenuibus, antice crassioribus; natibus prominulis; epidermide luteola, valde radiata; dentibus cardinalibus parviusculis, conicis crenulatisque; lateralibus sublongis rectisque; margarita alba et valde iridescente.

Shell smooth, elliptical, inflated, very inequilateral, obtusely angular behind, rounded before; valves thin, thicker before; beaks a little prominent; epidermis yellowish, very much radiated; cardinal teeth rather small, conical and crenulate; lateral teeth rather long and straight; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Swamp Creek, Whitfield Co., Geo., Maj. Downie, and head-waters of the Holston, Washington Co., Va., Prof. Cope.

My cabinet and cabinet of Academy of Natural Sciences.

Diam. ·6, Length ·9, Breadth 1·5 inch.

Shell smooth, elliptical, inflated, very inequilateral, obtusely angular behind, rounded before; substance of the shell thin, thicker before; beaks a little prominent; ligament short and dark brown; epidermis yellowish, very much radiated, with distant marks of growth; umbonial slope raised and rounded; posterior slope elliptical, carinate, with two impressed lines from the beaks to posterior margin; cardinal teeth rather small, conical and crenulate; lateral teeth rather long and straight; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather deep and angular; nacre white and iridescent.

Remarks.—Four specimens before me, sent from Swamp Creek, Georgia, by Major Downie, are not, perhaps, either of them full-grown. The largest is nearly one and a half inches wide,—a male, which is figured. A single specimen—a female—was brought by Prof. Cope from the head-waters of the Holston. This is two inches wide, and no doubt mature. This species is allied to *radians* (nobis), and so near to that species that I have doubted until recently whether it was not a variety only. But it differs in being less wide, less yellow in the epidermis, and in having higher beaks.

UNIO LINCECUMII. Pl. 49, fig. 125.

Testa plicata, rotundata, subglobosa, valde inæquilaterali; valvulis percrassis, antice crassioribus; natibus prominentibus, tumidis, incurvis, ad apices minute undulatis; epidermide tenebroso-fusca, nigricante, eradiata; dentibus cardinalibus percrassis, solidis, erectis corrugatisque; lateralibus longis, subcrassis et obliquis; margarita argentea et valde iridescente.

Shell plicate, rounded, subglobose, very inequilateral; valves very thick, thicker before; beaks prominent, swollen, incurved, minutely undulate at the tips; epidermis dark brown, blackish, without rays; cardinal teeth very thick, solid, erect and corrugate; lateral teeth rather thick and oblique; nacre silver-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Dallas Co., Texas, Prof. Forshey; Brazos River, Central Texas, Dr. Gideon Lincecum.

My cabinet and cabinet of Smithsonian Institution.

Diam. 1·5, Length 1·9, Breadth 2.4 inch.

Shell plicate, rounded, subglobose, very inequilateral, rounded before and behind; substance of the shell very thick, thicker before; beaks prominent, swollen, incurved, minutely undulate at the tips; ligament rather short, very thick and chestnut-brown; epidermis dark brown, blackish, polished towards the beaks, without rays, with rather close marks of growth; umbonial slope raised and rounded; posterior slope cordate, slightly raised; cardinal teeth large, very thick, solid, erect, corrugate and crenulate; lateral teeth rather thick, slightly curved and oblique; anterior cicatrices distinct, rather small, corrugate and deeply impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices placed above the cavity of the beaks;

cavity of the shell deep and rounded; cavity of the beaks very deep and sharply angular; nacre silver-white and very iridescent.

Remarks.—Three specimens of this shell are before me. Two I have had for some years from Prof. Forshey; the third was recently received from the Smithsonian Institution, having been collected by Dr. Lincecum and presented to that Institution. This species is remarkable among the plicate shells for its globose form and its black epidermis. In the remarks on *Brazosensis* I have stated the difference between these species. It differs from *plicatus*, Lesueur, in being rotund and globose. A very indistinct raised line passes down the umbonial slope and cuts the folds, of which there are five or six. *Plicatus* usually has three or four folds, which are much larger. The marginal line is reddish, somewhat like *Brazosensis*. The epidermis of the most perfect specimen is almost polished, and the nacre of remarkable brilliancy. The undulations of the tips are small, subconcentric, and are four or five in number. This species need not be confounded with either *purplicatus*, Con., *Elliottii*, or *atrocostatus*, nobis. I have pleasure in naming this species after Dr. Lincecum, of Texas, who, while collecting plants, has also gathered the interesting inhabitants of the waters of his State.

UNIO TOPEKAENSIS. Pl. 49, fig. 126.

Testa lævi, lata, subcompressa, valde inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus prominulis, ad apices undulatis; epidermide tenebroso-fusca, radiata; dentibus cardinalibus erectis, compressis crenulatisque; lateralibus longis rectisque; margarita cæruleo-alba et valde iridescente.

Shell smooth, wide, somewhat compressed, very inequilateral, obtusely angular behind, rounded before; valves a little thick, thicker before; beaks a little prominent, undulate at the tips; epidermis dark brown, radiate; cardinal teeth erect, compressed and crenulate; lateral teeth long and straight; nacre bluish-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Topeka, Kansas, Prof. Daniels; Little Arkansas River, Dr. Le Conte; Rock Creek, Kansas, F. Hawn; Walnut Creek, Santa Fe Road, Mr. Idler; Falls City, Nebraska, Prof. Hayden; Verdigris River, Kansas.

My cabinet and cabinets of the Academy of Natural Sciences and Smithsonian Institution.

Diam. ·6, Length ·9, Breadth 2 inches.

Shell smooth, wide, somewhat compressed, very inequilateral, obtusely angular behind, rounded before; substance of the valves a little thick, thicker before; beaks a little prominent, much undulated at the tips; ligament long, thin and brown; epidermis dark brown, smooth, shining, radiated all over, with distant marks of growth; umbonial slope slightly raised and rounded; posterior slope very narrow and slightly raised; cardinal teeth erect, compressed and crenulate; lateral teeth long and straight; anterior cicatrices distinct and moderately well impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of the shell rather deep and very wide; cavity of the beaks rather shallow and rounded; nacre bluish-white and very iridescent.

Remarks.—Nearly a dozen specimens of this shell, of various ages and different habitats, are before me. For many years I have had several, but its close resemblance to *nasutus,* Say, on one side, and to *Ruttersvillensis* and *Bairdianus* (nobis) on the other, made me hesitate. More recently I have better specimens from other habitats in Kansas and Nebraska, which no longer leave any doubt. In outline it is not so transverse as *nasutus,* and the undulations differ. In *Topekaensis* the tips of the beaks are embellished with two series of undulations, which meet in the middle and form somewhat acute angles pointing to the vertex. *Bairdianus* is a much smaller species, less transverse, and has concentric undulations on the beaks. Like *nasutus,* this species has, in perfect specimens, green rays over nearly the whole disk, and the enlargement of the female in the vicinity of the branchial uterus is very much the same. In the character of the undulations of the beaks it is the same as *Ruttersvillensis,* but that shell is not so transverse, and the female is more inflated.

UNIO CORVUNCULUS. Pl. 50, fig. 127.

Testa lævi, elliptica, subinflata, valde inæquilaterali, antice et postice rotundata; valvulis crassiusculis, antice crassioribus; natibus prominulis, ad apices subconcentrico-undulatis; epidermide nigricante, eradiata; dentibus cardinalibus parvis, erectis, subcompressis crenulatisque; lateralibus sublongis et subcurvatis; margarita purpurea et iridescente.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and behind; valves a little thick, thicker before; beaks a little prominent, concentrically undulate at the tips; epidermis blackish, without rays; cardinal teeth small, erect, somewhat compressed and crenulate; lateral teeth long and slightly curved; nacre purple and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 144.

Hab.—Swamp Creek, Whitfield Co., Georgia, Major T. C. Downie.

My cabinet and cabinets of Academy of Natural Sciences and Mr. C. M. Wheatley.

Diam. ·5, Length ·7, Breadth 1·2 inch.

Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and behind; substance of the shell a little thick, thicker before; beaks a little prominent, concentrically undulate at the tips; ligament short, thin and brown;

epidermis blackish, without rays, with rather distant marks of growth; umbonial slope raised and rounded; posterior slope narrow elliptical, slightly carinate; cardinal teeth small, erect, somewhat compressed and crenulate; lateral teeth rather long and slightly curved; anterior cicatrices distinct, small and well impressed; dorsal cicatrices placed across the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and obtusely angular; nacre purple and iridescent.

Remarks.—Quite a number of this little purple-nacred species, with its black epidermis, was sent to me by Major Downie. It belongs to the group of which *parvus*, Barnes, may be considered the type. It more closely resembles *glans* (nobis) on one side and *paulus* on the other. The epidermis is black, like *paulus*, but it may be distinguished by being less transverse and in not having a white nacre. From *glans* it may be distinguished by being less solid, less ventricose, and having a deeper purple nacre. Every one of the specimens before me has the disk entirely of a deep purple, except the anterior basal margin, which is not quite white, being along the edge of a pale purple.

UNIO VALLATUS. Pl. 50, fig. 128.

Testa nodulosa, rotundata, lenticulari, subinflata, inæquilaterali; valvulis crassis, antice crassioribus; natibus subprominentibus; epidermide luteo-fusca, eradiata; dentibus cardinalibus pergrandibus, elevatis granulatisque; lateralibus crassis, curtis et obliquis; margarita argentea et iridescente.

Shell nodulous, rounded, lenticular, somewhat inflated, inequilateral; valves thick, thicker before; beaks somewhat prominent; epidermis yellowish-brown, without rays; cardinal teeth very large, raised and granulate; lateral teeth thick, short and oblique; nacre silver-white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 145.

Hab.—Alabama River, Dr. Showalter.

My cabinet and cabinet of Dr. Showalter.

Diam. 1·2, Length 2·1, Breadth 2·3 inches.

Shell nodulous, rounded, lenticular, somewhat inflated, inequilateral; substance of the shell thick, thicker before; beaks somewhat prominent; ligament short, thick and light brown; epidermis yellowish-brown, without rays, with rather close lines of growth; umbonial slope raised and rounded; posterior slope subcordate, slightly carinate, furnished with curved rows of nodules; cardinal teeth very large, raised and granulate; lateral teeth thick, short and oblique; anterior cicatrices distinct, large and deeply impressed; posterior cicatrices distinct, large and well impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks very deep and angular; nacre silver-white and iridescent.

Remarks.—A single specimen only was sent by Dr. Showalter to Dr. Lewis, who kindly sent it to me. It does not seem to have been before observed. It cannot well be confounded with any other species. It is much more lenticular than any other nodulous *Unio* with which I am acquainted. It is allied to *pustulosus* and *turgidus* (nobis), but differs much from them both. The specimen before me is nearly in the form of a thick lens, and covered with nodules except on the anterior and anterior-basal portions. The nodules on the posterior slope run into lines towards the margin. It is not high in the beaks as *pustulosus,* nor has it the broad green rays which that and *turgidus* have. The teeth are remarkably robust.

UNIO PLANIOR. Pl. 50, fig. 129.

Testa subsulcata, subtriangulari, ad latere planulata, inæquilaterali; valvulis crassiusculis, antice crassioribus; natibus subprominentibus; epidermide vel lutea vel ochracea, radiata; dentibus cardinalibus parvis, compressis striatisque; lateralibus longis, crassiusculis et obliquis; margarita alba et iridescente.

Shell subsulcate, subtriangular, flattened at the sides, inequilateral; valves a little thick, thicker before; beaks somewhat prominent; epidermis yellow, or ochraceous and radiate; cardinal teeth small, compressed and striate; lateral teeth long, somewhat thick and oblique; nacre white and iridescent.

Proc. Acad. Nat. Sci. 1868, p. 145.

Hab.—Tennessee, Mr. H. Moores; head-waters of Holston River, Washington County, Va., Prof. Cope.

My cabinet and cabinets of the Academy of Natural Sciences and Mr. Moores.

Diam. ·8, Length 1·5, Breadth 2·3 inches.

Shell somewhat sulcate, subtriangular, flattened at the sides, inequilateral, subbiangular behind and rounded before; substance of the shell a little thick, thicker before; beaks somewhat prominent; ligament rather thick, short and light brown; epidermis yellow or ochraceous, with broad maculate rays and with rather distant marks of growth; umbonial slope slightly raised and flattened; posterior slope narrow elliptical, carinate, with an impressed line from the beaks to the posterior margin; cardinal teeth small, compressed and striate; lateral teeth long, somewhat thick and oblique; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks somewhat deep and angular; nacre white and iridescent.

Remarks.—The specimen from Mr. Moores has been in my possession for some time; from what river it came is not known. Recently Prof. Cope has brought the same species from the head-waters of the Holston, which, although dead and imperfect specimens, leaves no doubt of the identity of the species. It belongs to the same group with *negatus* and *Estabrookii* (nobis), but cannot be mistaken for either. It is not so stout nor so triangular as *negatus*, nor is it as triangular as *Estabrookii*, or as much sulcate. The furrows are very small, and in the worn specimens are not very observable. The posterior portion of the nacre of two specimens is of that peculiar golden color—satin-like—which some of the *Uniones* exhibit. The rays are on the flattened sides before the umbonial slope, and are maculate, being interrupted by the marks of growth.

UNIO REFULGENS. Pl. 51, fig. 130.

Testa nodulosa, rotundata, lenticulari, inæquilaterali; valvulis subcrassis, antice crassioribus; natibus prominulis; epidermide rufo-castanea, aliquanto polita; dentibus cardinalibus subgrandibus, eleganter corrugatis crenulatisque; lateralibus longiusculis, obliquis, minute corrugatis; margarita albida, ad marginem purpurescente et elegantissime iridescente.

Shell nodulous, rounded, lenticular, inequilateral; valves somewhat thick, thicker before; beaks slightly prominent; epidermis reddish-chestnut color, somewhat polished; cardinal teeth rather large, beautifully corrugate and crenulate; lateral teeth rather long, oblique and minutely corrugate; nacre whitish, purplish at the margin and beautifully iridescent.

Proc. Acad. Nat. Sci. 1868, p. 145.

Hab.—Oktibbeha River, Lauderdale Co., Mississippi, W. Spillman, M.D.

My cabinet and cabinets of Academy of Natural Sciences and Dr. Spillman.

Diam. 1, Length 1·6, Breadth 1·9 inch.

Shell nodulous, rounded, lenticular, inequilateral, disposed to be very obtusely angular at the posterior basal margin; substance of the shell somewhat thick, thicker before; beaks a little prominent; ligament rather short and light brown; epidermis reddish chestnut-brown, somewhat polished, with rather distant marks of growth, with two indistinct rays on the posterior slope on each valve; umbonial slope slightly raised into an obtuse angle; posterior slope raised almost to a wing, and furnished with a few nodules; cardinal teeth rather large, double in the left and treble in the right valve, beautifully corrugate and crenulate; lateral teeth somewhat thick and long, oblique, minutely and beautifully corrugate; anterior cicatrices distinct and well impressed; posterior cicatrices confluent and large; dorsal cicatrices placed on the plate above the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks deep and angular; nacre pearly-white in the cavity, beautifully purple towards the margin and refulgently iridescent.

Remarks.—Among a number of *Unionidæ* sent to me from the State of Mississippi by Dr. Spillman were three specimens of this species, which I have not heretofore seen. It has some resemblance to *verrucosus*, Bar., from Tennessee, in outline, but differs entirely from that species in being lenticular and not having the beaks much raised. It differs also in the color of the epidermis, *refulgens* being of a very dark chestnut-brown. The beaks will, I think, be found to differ. The specimens before me have neither of the beaks perfect enough to display any undulations, which are so marked and so beautiful in the *verrucosus*. The prominent characteristics of *refulgens* are the lenticular form and the very remarkable nacre. In all the specimens before me the inner portion of the nacre is pearly white, while the outer or border portions are of a rich purple, the posterior part exhibiting an iridescence so refulgent as to surpass any other species, in this respect, which I know. The younger specimen has a broader purple border. The nodules in the specimens before me are placed on the medial third of the disk, and are separate, unusually obtusely angular, and pointing downward. On the posterior slope there are a few nodules.

UNIO STREBELII. Pl. 51, fig. 131.

Testa lævi, oblonga, ad latere compressa, inæquilaterali, postice obtuse biangulata, antice rotundata; valvulis subcrassis, antice aliquanto crassioribus; natibus prominulis; epidermide luteo-fusca, radiata; dentibus cardinalibus subcrassis, elevatis, crenulatis, in utroque valvulo duplicibus; lateralibus sublongis, subcrassis, subcurvatis corrugatisque; margarita vel purpurea vel salmonea et valde iridescente.

Shell smooth, oblong, flattened at the sides, inequilateral, obtusely biangular behind and rounded before; valves rather thick and somewhat thicker before; beaks a little prominent; epidermis yellowish brown, radiate; cardinal teeth rather thick, raised, crenulate and double in both valves; lateral teeth rather long, rather thick, somewhat curved and corrugate; nacre purple or salmon colored and very iridescent.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Vera Cruz, Mexico, G. Strebel, M. D.

My cabinet and cabinet of Smithsonian Institution.

Diam. 1, Length 1·6, Breadth 2·9 inches.

Shell smooth, oblong, flattened at the sides, inequilateral, obtusely biangular behind and rounded before; substance of the shell rather thick, somewhat thicker before; beaks a little prominent; ligament large, rather short and dark brown; epidermis yellowish brown, radiate and with distant marks of growth; umbonial slope slightly raised and rounded; posterior slope narrow elliptical, slightly carinate; cardinal teeth rather thick, raised, crenulate and double in both valves; lateral teeth rather long, somewhat thick, somewhat curved and corrugate; anterior cicatrices distinct, somewhat large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row near to the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and obtusely angular; nacre purple or salmon color and very iridescent.

Soft parts.—Three young specimens, not half grown, were received. None had ova in the ovarium or embryos in the branchial uterus. *Branchiæ* rather small and rounded, the inner ones the larger, united the whole length of abdominal sack. *Palpi* small, ovate, united at the upper posterior edges. *Mantle* very thin, thicker on the edges. *Branchial opening* rather large, with small dark papillæ. *Anal opening* very small, with numerous, very small papillæ on the inner edges. *Super-anal opening* rather large and edged with black. Color of the mass whitish.

Remarks.—This species belongs to the *complanatus* group. It is closely allied to those of that portion of it which is disposed to be biangular behind. It differs in being less carinate, having rather thicker teeth, and it differs also somewhat in the rays. Of the two specimens before me, one has a deep purple nacre throughout, the other is salmon color in the cavity, but towards the margin it is white. I have no doubt that specimens will be found of a full salmon color and others entirely white. These two specimens were sent to the Smithsonian Institution by Dr. Strebel, of Vera Cruz, and to him I dedicate the species.

UNIO SPHÆRICUS. Pl. 51, fig. 132.

Testa nodulosa, subrotunda, valde inflata, subglobosa, fere æquilaterali; valvulis crassis, antice crassioribus; natibus elevatis; epidermide rufo-castanea, eradiata; dentibus cardinalibus pergrandibus, corrugatis crenulatisque; lateralibus curtis, crassis, corrugatis, obliquis subcurvisque; margarita argentea et valde iridescente.

Shell nodulous, rotund, very much inflated, subglobose, nearly equilateral; valves thick, thicker before; beaks raised; epidermis reddish chestnut color, without rays; cardinal teeth very large, corrugate and crenulate; lateral teeth short, thick, corrugate, oblique and somewhat curved; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 145.

Hab.—Pearl River, at Jackson, Mississippi, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1·3, Length 1·8, Breadth 1·9 inch.

Shell nodulous, rounded, very much inflated, subglobose, nearly equilateral; substance of the shell thick, thicker before; beaks raised and recurved; ligament short, thick and dark brown; epidermis reddish-chestnut color, with rather distant marks of growth; umbonial slope raised and obtusely angular; posterior slope cordate and slightly raised into a carina; cardinal teeth very large, corrugate and crenulate; lateral teeth short, thick, corrugate, oblique and somewhat curved; anterior cicatrices distinct, rather small and very deeply impressed; posterior cicatrices confluent, large and well impressed; dorsal cicatrices placed on the base of the cardinal teeth; cavity of the shell deep and rounded; cavity of the beaks deep and obtusely angular; nacre silver white and iridescent.

Remarks.—Mr. Wheatley presented me with two specimens of this species which I had not before seen. One seems to be full grown, the other about one-third grown. It is nearly allied to *U. pustulosus* (nobis), and in outline is nearly the same, but *sphœricus* is more carinate on the posterior slope and is there obtusely angular. It differs also in the form and number of the nodules, *sphœricus* having few, and those small and not well pronounced. The specimens of *pustulatus* from the same habitat have higher beaks and more well characterised nodules. There is also a difference in the marks of growth, which are very much further apart in *sphœricus*. The color of the epidermis is also different, in being of a dark chestnut-brown, which causes the marginal edge to be a reddish line under the nacre. The nacre of the adult specimen is beautifully white, with a disposition to a pinkish tinge. The young specimen has a purplish nacre. It cannot be confounded with *refulgens*, herein described, although it has nearly the same colored epidermis and nodules, resembling, in a measure, that species, the nacre of which is brighter and purple. In regard to inflation they are very different, *refulgens* being lenticular, while *sphœricus* is globose. *Sphœricus* has a wide, shallow groove immediately before the umbonial slope.

UNIO VERACRUZENSIS. Pl. 52, fig. 133.

Testa lævi, elliptica, subcompressa, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis tenuibus; natibus prominulis; epidermide tenebroso-fusca, radiata politaque; dentibus cardinalibus parvis, compressis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, rectis lamellatisque; margarita cærulea et valde iridescente.

Shell smooth, elliptical, somewhat compressed, inequilateral; obtusely angular behind, rounded before; valves thin; beaks slightly prominent; epidermis dark brown, radiated and polished; cardinal teeth small, compressed, crenulate and double in both valves; lateral teeth long, straight and lamellar; nacre bluish and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 150.

Hab.—Vera Cruz, G. Strebel, M. D.

Cabinet of Smithsonian Institution.

Diam. ·4, Length ·7, Breadth 1·2 inch.

Shell smooth, elliptical, somewhat compressed, inequilateral, obtusely angular behind, rounded before; substance of the shell thin; beaks a little prominent, very slightly inflated; ligament very short, thin and light brown; epidermis dark brown, radiated all over and polished; umbonial slope low and rounded; posterior slope slightly raised and has two impressed lines in each valve; cardinal teeth small, compressed, crenulate and double in both valves; lateral teeth long, straight and double in both valves; anterior cicatrices distinct, small and slightly impressed; posterior cicatrices confluent and very slightly impressed; dorsal cicatrices placed in the cavity and on the under side of the plate; cavity of the shell shallow; cavity of the beaks very shallow and subangular; nacre bluish, passing into pink at the teeth.

Soft parts.—Probably a young male; a single specimen. *Branchiæ* small and very thin, inner one much the larger, rounded below and united the whole length of abdominal sack. *Palpi* small, elongate, oval and united only above. *Mantle* very thin, slightly thickened at the edges. *Branchial opening* rather large, with numerous, small papillæ on the inner edges, which are nearly black. *Anal opening* very small, with numerous, very small papillæ on the inner edges. *Super-anal opening* rather large and united below. Color of the mass white.

Remarks.—A single specimen, in alcohol, only was received, in the "envoi" of Dr. Strebel, and this probably only half grown. In outline it is near to *Medellinus* (nobis), from Mexico, but still nearer to *subangulatus* (nobis), of Georgia. The specimen before me has rays over the whole disk, but they are indistinct, and this may arise from its being a long time in alcohol. It is probable that old specimens would be without rays. The teeth of this specimen are pinkish and old specimens, if the nacre be thick, are likely to have the whole interior more or less pink or purplish. The beaks are eroded and do not present any undulations, which may exist at the tips.

UNIO ORTONII. Pl. 52, fig. 134.

Testa plicata, lato-elliptica, compressa, valde inæquilaterali, postice angulata, antice rotundata; valvulis crassis, antice crassioribus; natibus prominulis; epidermide rufo-fusca, eradiata; dentibus cardinalibus multipartitis, flexuosis curtisque; lateralibus prelongis, curvatis corrugatisque; margarita albida et valde iridescente.

Shell folded, widely elliptical, compressed, very inequilateral, angular behind and rounded before; valves thick, thicker before; beaks slightly prominent; epidermis reddish-brown, without rays; cardinal teeth much divided, bent and short; lateral teeth very long, curved and roughened; nacre whitish and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 161.

Hab.—River Napo, Equador, Prof. Orton.

Cabinet of Smithsonian Institution.

Diam. 1·6, Length 3·1, Breadth 5·3 inches.

Shell folded, widely elliptical, compressed, very inequilateral, angular behind and rounded before; substance of the shell thick, thicker before; beaks slightly prominent; ligament long and thick; epidermis reddish-brown, without rays; umbonial slope raised and furnished with five or six rather distant irregular folds; posterior slope raised into a sharp carina; cardinal teeth much divided into eight or nine curved denticles, the anterior one being much the larger; lateral teeth very long, lamellar, curved and roughened; anterior cicatrices distinct, large, well impressed and divided into three rounded impressions; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of the shell shallow, very wide and with a broad furrow from the beaks to the posterior basal margin; cavity of the beaks very shallow and scarcely perceptible; nacre whitish and very iridescent.

Remarks.—A single valve only—the right one—is before me. This is a matter of great regret, because this is a very remarkable shell, entirely new, and we have the advantage of seeing only an imperfect valve, for this has been ground on the margins so that I cannot determine whether it does not belong to the *alate* division and come near to *U. Myersianus* (nobis), from Siam. The outline is nearly the same, and perfect specimens may be alate if not bialate. The cardinal teeth of the young may also be quite different, as in *Myersianus.* There is a very marked difference in *Ortonii* from any species of the *Unionidæ* I have seen. There are two wide ridges from the beaks to the posterior margin, and these enlarge as they are projected towards the margin. On the posterior ridge, which really forms the umbonial slope, there are six folds of low elevation. The nacre is remarkably beautiful, being satin-like. The epidermis is unusually thin and very nearly all lost from the specimen. I have great pleasure in naming this shell after Prof. Orton, who brought it from the River Napo. The lateral tooth is long and lamellar, like any wide *Unio,* but the cardinal tooth is divided more like *Iridina,* and in this it is somewhat like an old *Unio Myersianus* (nobis), the teeth of which differ very much from the young.

ANODONTA STREBELII. Pl. 52, fig. 135.

Testa lævi, elliptica, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis pertenuis; natibus prominulis; epidermide tenebroso-viridi, radiis capillaris indutis; margarita cærulea et valde iridescente.

Shell smooth, elliptical, inequilateral, obtusely angular behind, rounded before; valves very thin; beaks a little prominent; epidermis dark green, covered with capillary rays; nacre bluish and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 150.

Hab.—Vera Cruz, Mexico, G. Strebel, M. D.

Cabinet of the Smithsonian Institution.

Diam. ·6 Length ·9 Breadth 1·5 inch.

Shell smooth, elliptical, inequilateral, obtusely angular behind and rounded before; substance of the shell very thin, not thickened before, translucent, so as to show the rays; beaks a little prominent and slightly inflated; ligament rather long, thin and nearly concealed; epidermis dark green, with very numerous, close capillary rays, which cover the whole disk; umbonial slope low and rounded; posterior slope raised into a carina; anterior cicatrices confluent, large and very slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices invisible; cavity of the shell rather shallow; cavity of the beaks shallow and obtusely angular; nacre blue, very thin. The dorsal edge thickened and slightly curved upward at the anterior end.

Soft Parts.—A single female, and probably not half-grown. Ova were found in the ovarium, but none in the branchial uterus. *Branchiæ* small, inner ones much the larger, rounded below, united the whole length of abdominal sack. *Palpi* small, rounded below and subangular posteriorly, united only above. *Mantle* very thin, thickened and colored at the edges. *Branchial opening* rather small, dark on the edges, with rather coarse papillæ. *Anal opening* very small, with a few small papillæ, the edges being united below. *Super-anal opening* rather large, the edges being open below with the anal opening. Color of the mass whitish.

Remarks.—A single specimen only of this species was received in alcohol by the Smithsonian Institution from Dr. Strebel. I am kindly permitted by Prof. Henry, Secretary of that admirable Institution, to describe this and *Unio Veracruzensis*, and it gives me great pleasure to call it after Dr. Strebel, who took it from the fresh waters near Vera Cruz. In outline it is nearly allied to *An. undulata*, Say, but differs in being a thinner species, in not having any callus under the hinge, and being covered with beautiful capillary rays over the whole disk. The beaks are not perfect enough to display any undulations, if there be any belonging to the species.

UNIO PRUNOIDES. Pl. 53, fig. 136.

Testa lævi, elliptica, valde ventricosa, inæquilaterali, antice et postice rotundata; valvulis subcrassis, antice aliquanto crassioribus; natibus prominulis; epidermide tenebroso-fusca, eradiata; dentibus cardinalibus compressis, obliquis et valde crenulatis; lateralibus longis, lamellatis corrugatisque; margarita argentea.

Shell smooth, elliptical, very ventricose, inequilateral, rounded before and behind; valves rather thick, somewhat thicker before; beaks somewhat prominent; epidermis dark brown, without rays; cardinal teeth compressed, oblique and very much crenulated; lateral teeth long, lamellar and corrugate; nacre silver-white.

Proc. Acad. Nat. Sci. 1868, p. 150.

Hab.—South America?

Cabinet of the Academy of Natural Sciences.

Diam. 1·1, Length 1·3, Breadth 2 inches.

Shell smooth, elliptical, very ventricose, inequilateral, rounded before and behind;

substance of the shell rather thick, somewhat thicker before; beaks somewhat prominent; ligament rather short and thin; epidermis dark brown, without rays; umbonial slope raised and rounded; posterior slope wide and cordate; cardinal teeth compressed, oblique and very much crenulate, double in the right and disposed to be treble in the left valve; lateral teeth long, lamellar and corrugate; anterior cicatrices confluent, rather small and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell very deep and rounded; cavity of the beaks deep and rounded; nacre silver-white.

Remarks.—A single specimen, which was found among several of *U. corrugata*, Lam., in the collection of the Academy of Natural Sciences. I have little doubt but that it is a native of some of the rivers of South America. The beaks are very much eroded. If they were perfect in the specimen their character would, I think, prove the truth of this suggestion. The character of the cardinal teeth is similar to some of the South American species. In the left valve it is treble, the anterior division being very small, the middle one the largest. In the right valve the cardinal tooth is double. The anterior cicatrices are so confluent as to show no disposition to be separated. There is no appearance of this specimen ever having had rays, but it is very far from being a perfect individual, and young and perfect ones may be rayed.

ANODONTA NAPOENSIS. Pl. 53, fig. 137.

Testa lævi, oblongo-elliptica, subcompressa, valde inæquilaterali, antice et postice rotundata; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fusca, encarpiformi, flexuosa, obsolete radiata; margarita pallido-viridi, non iridescente.

Shell smooth, oblong-elliptical, rather compressed, very inequilateral, rounded before and behind; valves rather thick; beaks a little prominent; epidermis dark brown, festooned, flexuous, obscurely radiate; nacre pale green and not iridescent.

Proc. Acad. Nat. Sci. 1868, p. 162.

Hab.—River Napo, Equador, South America, Prof. Orton.

My cabinet and cabinet of the Smithsonian Institution.

Diam. ·7, Length 1·3, Breadth 2·4 inches.

Shell smooth, oblong-elliptical, somewhat compressed, very inequilateral, rounded before and behind; substance of the shell rather thick; beaks a little prominent; ligament long, rather thick and dark; epidermis dark brown, festooned, flexuous, obscurely radiate; umbonial slope rounded, with an elevated line from the beaks to posterior margin; posterior slope slightly raised into a carina; anterior cicatrices distinct, the larger one being very large and well impressed, the smaller one being very small and not much impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices indistinct; cavity of the shell shallow and wide; cavity of the beaks very shallow; nacre pale green and not iridescent.

Remarks.—Two odd valves—a right and left—were sent to me by the Smithsonian Institution. The larger and more perfect one is figured, but that is not perfect on the dorsal margin, while the epidermis is nearly perfect. Both the specimens have the epidermis covered with the wrinkled festoon-like character. In outline it is near to *Schrœteriana* (nobis), but it is of a more perfect ellipse and is a thicker shell. Like *crispata*, Lam., it is covered with wrinkles, but it is more likely to be confounded with *tenebricosa* (nobis) from the dark color of the nacre and thickness of the shell. It may, however, be easily distinguished by its being elliptical, while the other is oblong, having a higher elevation of the posterior slope.

UNIO CHINENSIS. Pl. 53, fig. 138.

Testa nodulosa, subelliptica, inflata, fere æquilaterali, postice obtuse angulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus subprominentibus, ad apices corrugatis; epidermide virido-lutea, radiis viridis undique indutis; dentibus cardinalibus erectis, compressis, striatis, crenulatis et in utroque valvulo subduplicibus; lateralibus sublongis subrectisque; margarita argentea et valde iridescente.

Shell nodulous, subelliptical, inflated, nearly equilateral, obtusely angular behind, rounded before; valves somewhat thick, thicker before; beaks somewhat prominent, corrugate at the tips; epidermis greenish-yellow, covered all over with green rays; cardinal teeth erect, compressed, striate, crenulate, and in both valves subduplicate; lateral teeth rather long and nearly straight; nacre silver-white and very iridescent.

Proc. Acad. Nat. Sci. 1868, p. 150.

Hab.—Hong Kong, China.

Cabinet of Yale College, New Haven, Conn.

Diam. ·9, Length 1·1, Breadth 1·7 inch.

Shell nodulous, subelliptical, inflated, nearly equilateral, obtusely angular behind, rounded before; substance of the shell somewhat thick, thicker before; beaks somewhat prominent, corrugate at the tips; ligament very short and narrow; epidermis greenish-yellow, covered all over with beautiful green rays, with very distant lines of growth; umbonial slope raised and sharply angular; posterior slope flattened, cordate, with two lines from beaks to posterior margin on each valve; cardinal teeth erect, compressed, striate, crenulate, disposed to be double in both valves; lateral teeth rather long and nearly straight; anterior cicatrices distinct and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices set deeply within the cavity of the beaks; cavity of the shell deep; cavity of the beaks deep and angular; nacre silver-white and very iridescent.

Remarks.—A single specimen of this beautiful and interesting species was submitted to me by Mr. Anthony as the property of Yale College, with permission to describe it if new. It is remarkable for the beauty of its epidermis, which is covered with green rays over nearly the entire disk, the posterior slope having two rather thin rays on each valve. There are but two marks of growth on this specimen, being unusually distant. The corrugations come down one-third the distance from the tips of the beaks. There is no species which I know of which can be confounded with this, unless it be *U. Lampreyanus,* Baird and Adams, which species I have not seen. But it is evident from their description and figures (Zool. Journ., part 2, 1867) that the species are distinct. *Lampreyanus* is described and figured as being much plicated, compressed and solid, as well as being subtriangular, neither of which characters apply to *Chinensis.* The specimen under view came from Hong Kong, but I suspect it has been taken there from the north of China. If it had been a native of the province of Quang-Tong, the commerce of Canton would certainly have furnished it among the immense number of shells which it has supplied Europe and America within the last century.

In vol. 4 of the Journal of the Academy of Natural Sciences (Observations on the Genus Unio, etc., vol. 6) I published descriptions of the soft parts and embryonic forms, with figures, of many of the species of the *Unionidæ.* In subsequent volumes I continued to describe these forms whenever I had been able to obtain them. Through the kindness of Professor Henry I have before me the soft parts of several known species, and some which are new, from Vera Cruz, Mexico, which were sent by Dr. Strebel to the Smithsonian Institution. It is greatly to be regretted that these seem to have been taken at a period of the year when the ovarium was empty of ova, and the branchial uteri without embryos. To these descriptions I add others of the soft parts of some species from Alabama, which were kindly sent to me in alcohol by Dr. Showalter, of which species the hard parts, or outward covering only, have been described.

Unio pliciferus, Lea. Vera Cruz.—Among a large number none had ova in the ovarium, nor embryonic shells in the branchial uterus. *Branchiæ* large and rounded below, inner one much the larger, free the whole length of abdominal sack. *Palpi* small, elliptical, united above. *Mantle* thin, thicker on the edges. *Branchial opening* large, with numerous small papillæ on the inner edges, which are of a dark brown color. *Anal opening* rather large, with very numerous small papillæ on the inner edges. *Super-anal opening* rather small, united below and colored on the edges. Color of the mass white.

Unio umbrosus, Lea. Vera Cruz.—Among a number, none of these, like *pliciferus,* had ova in the ovarium, nor embryonic shells in the branchial uterus. *Branchiæ* very large and rounded below, inner one being the larger; united the whole length of abdominal sack. *Palpi* large, elliptical, open on posterior side to the top. *Mantle* very large, thin, with a broad thickened border. *Branchial opening* rather large, with rather large coarse papillæ. *Anal opening* large, with numerous very minute colored papillæ on the inner edges. *Super-anal opening* rather small, colored on the edges and united below. Color of the mass whitish. All the specimens, old and young, had pearly granulations on the middle of the cavity of the valves.

Unio granulatus, Lea. Coosa River, Alabama, Dr. Showalter.—Six specimens were received. None had charged branchial uteri, but ova were found in the ovarium. *Branchiæ* small, rounded below, the outer one shorter and extending, posteriorly, beyond the inner one, free nearly the whole length of abdominal sack. *Palpi* very small, very thin and subelliptical. *Mantle* very thin. *Branchial opening* small, with a few papillæ, terminating with a *caruncle* as in *parvus*, Bar. The four *males* have *no caruncle*. *Anal opening* rather large and apparently without papillæ. Seems to have no *super-anal opening*. Color of the mass white.

Unio consanguineus, Lea. Coosa River, Alabama, Dr. Showalter.—Four females and one male. None had charged branchial uteri, but ova were found in the ovarium. *Branchiæ* rather small, inner one much the larger and rounded. Free nearly the whole length of abdominal sack. *Palpi* very small, thin and subtriangular. *Mantle* very thin, dark along the edges. *Branchial opening* rather large, with papillæ on the inner edges. *Anal opening* rather large, with very minute papillæ. *Super-anal opening* long, and colored on the edges. Color of the mass whitish.

Unio Lewisii, Lea. Coosa River, Alabama, Dr. Showalter.—None of the specimens received had ova in the ovarium, nor embryonic shells in the branchial uterus. *Branchiæ* large and rounded below, inner one much the larger, free nearly the whole length of abdominal sack. *Palpi* very small, subtriangular, united above. *Mantle* large, thin, thicker and colored on the margin. *Branchial opening* large, with numerous papillæ on the inner edges, which are dark. *Anal opening* small, with very minute papillæ on the inner edges. *Super-anal opening* long, and slightly colored on the edges. Color of the mass whitish.

Margaritana Holstonia, Lea. Coosa River, Alabama, Dr. Showalter.—Two specimens only, both females, were received. One had ova in the ovarium, but there were no embryos in the branchial uterus. The other had the *branchial uteri* filled with embryonic shells matured in the branchial uteri. These were in form closely allied to those of *Anodonta undulata*, Say. *Branchial uteri* extend the whole width of the branchiæ. *Branchiæ* large, inner one the larger, free the whole length of abdominal sack. *Palpi* very small and subtriangular. *Mantle* very thin, thicker at the edges. *Branchial opening* large, dark colored, with papillæ on the inner edges. *Anal opening* rather small, with very indistinct papillæ. *Super-anal opening* very small, with dark edges. Color of the mass whitish.

GONIOBASIS WHEATLEYI. Pl. 54, fig. 1.

Testa striata, subfusiformi, subinflata, subcrassa, ochracea, vel vittata vel evittata; spira conoidea, ad apicem aliquanto plicata; suturis irregulariter impressis; anfractibus instar senis, fere planulatis; apertura subconstricta, ovata, intus ochracea; labro acuto, parum sinuoso; columella inflexa, reflexa et tortuosa.

Shell striate, subfusiform, subinflated, somewhat thick, ochraceous, banded or without bands; spire conoidal, sometimes folded at the tip; sutures irregularly impressed; whorls about six, nearly flat; aperture ovate, somewhat constricted; ochraceous within; outer lip acute, somewhat sinuous; columella inflected, reflected and twisted.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Coosa River, Alabama, Dr. Showalter.

My cabinet and cabinets of Dr. Showalter, Mr. Wheatley and Dr. Hartman.

Diam. ·54, Length 1·17 inch.

Remarks.—Four specimens of this fine large species were received from Dr. Showalter, one of which has four indistinct bands. It is among the larger ones from the Coosa, and is somewhat like a large rough *Bridgesiana* than any other species I know. The banded specimen is inclined to be of an olive-green color. The transverse striæ cut the longitudinal marks of growth, and on the upper part of the whorls cause that part to be corrugate. Dr. Showalter mentions that this shell was found in November of 1867 for the first time. The aperture is nearly one-half the length of the shell. I have great pleasure in dedicating this fine species to my friend, C. M. Wheatley, who is so unwearied in his efforts to promote a knowledge of our fresh-water *Molluscs.*

GONIOBASIS SIMILIS. Pl. 54, fig. 2.

Testa striata, subfusiformi, subtenui, luteo-cornea; spira brevi, ad apicem plicata; suturis impressis; anfractibus instar senis, vix convexis; apertura subgrandi, ovata, intus luteo-alba; labro acuto; columella inflexa et tortuosa.

Shell striate, subfusiform, rather thin, yellowish-horn color; spire short, folded at the tip; sutures impressed; whorls about six, scarcely convex; aperture rather large, ovate, within yellowish-white; outer lip acute; columella inflected and twisted.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet.

Diam. ·40, Length ·74 inch.

Remarks.—This species is allied to *Mel.* (*Gon.*) *harpa* (nobis), but differs in having a larger aperture, and in having more and closer striæ. It is also more yellow. In outline it is very nearly the same with *granatoides*, herein described, but it has not, like that species, any granules, and the two differ in the lower part of the aperture. The aperture is about one-half the length of the shell.

GONIOBASIS SULCATA. Pl. 54, fig. 3.

Testa striata, conica, subcrassa, mellea, evittata; spira obtusa; suturis irregulariter impressis; anfractibus instar septenis, planulatis, ad apicem plicatis; apertura parviuscula, rhomboidea, intus alba; labro acuto, sinuoso; columella inflexa, incrassata.

Shell striate, conical, somewhat thick, honey-yellow, without bands; spire obtuse; sutures irregularly impressed; whorls about seven, flattened, folded at the tip; aperture rather small, rhomboidal, white within; outer lip acute, sinuous; columella inflected and thickened.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Cahawba River, Alabama, Dr. Showalter.

My cabinet and cabinet of Dr. Showalter.

Diam. ·32, Length ·67 inch.

Remarks.—One of the four specimens before me is more slender than the other three, and may belong to another species. It is of the same honey-yellow color and the striæ are very much the same. The number of the striæ differs, varying from six to eight in the specimens before me, the middle ones being the largest. The aperture is more than one-third the length of the shell.

GONIOBASIS ARATA. Pl. 54, fig. 4.

Testa valde striata, conoidea, subtenui, cornea, vel vittata vel evittata; spira elevata; suturis impressis; anfractibus septenis, planulatis, ad apicem carinatis et plicatis; apertura parva, ovata, intus albida; labro aliquanto crenulato; columella inflexa, ad basim retrorsa.

Shell very much striate, conoidal, rather thin, horn color, banded or without bands; spire raised; sutures impressed; whorls seven, flattened, carinate and plicate at the tip; aperture small, ovate, whitish within; outer lip somewhat crenulate; columella inflected, drawn back at the base.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet.

Diam. ·35, Length ·75 inch.

Remarks.—Four specimens were received from Major Downie, one of which is darker and has five well developed bands, which are of a brown color and distinctly marked. In outline it is closely allied to *ornata*, herein described, but need not be confounded with that species, which differs in the aperture and other characters. The reflected base at the aperture separates it from its allied species. The aperture is about one-third the length of the shell.

GONIOBASIS GESNERII. Pl. 54, fig. 5.

Testa striata, fusiformi, tenui, tenebroso-oliva, evittata; spira subbrevi; suturis impressis; anfractibus instar septenis, planulatis; apertura grandi, late ovata, intus lugubri; labro acuto, parum sinuoso; columella purpurescente et valde contorta.

Shell striate, fusiform, thin, dark olive, without bands; spire rather short; sutures impressed; whorls about seven, flattened; aperture large, widely ovate, dark within; outer lip acute, somewhat sinuous; columella purplish and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Uchee River, Alabama, Mr. Wm. Gesner.

My cabinet.

Diam. ·37, Length ·80 inch.

Remarks.—A single specimen only was found among the shells sent by Mr. Gesner to Dr. Lewis. It is closely allied to *G. Gerhardtii* (nobis) in being about the size and of nearly the same outline. It is, however, without bands, is rather more flattened on the whorls and more rounded at the base of the columella. On the lower whorl of this specimen there are seven indistinct, rather distant striæ. The aperture is nearly one-half the length of the shell.

I name this after Mr. Wm. Gesner, of Milledgeville, Geo., who has sent a number of interesting species from Georgia.

GONIOBASIS WHITFIELDENSIS.* Pl. 54, fig. 6.

Testa valde striata, subfusiformi, subcrassa, tenebrosa; spira brevi; suturis irregulariter impressis; anfractibus instar quinis, vix convexis; apertura grandi, ovata, intus tenebroso-purpurea; labro subcrenulato; columella inflexa et parum contorta.

Shell much striate, subfusiform, somewhat thick, dark; spire short; sutures irregularly impressed; whorls about five, scarcely convex; aperture large, ovate, within dark purple; outer lip subcrenulate; columella inflected and somewhat twisted.

G. tenebrosa. Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet.

Diam. ·40, Length ·80 inch.

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* Changed from *tenebrosa*, which name is preoccupied.

Remarks.—This species belongs to a group of which *flavescens* (nobis) may be considered the type. It differs in being a smaller species, having a less elevated spire, having a less recurved columella at base, in having finer and closer transverse striæ and in having an aperture of purple within, with an edging of white. The striæ on the specimen before me are fifteen in number, and being strongly developed, form rather deep intermediate grooves. The aperture is about one-half the length of the shell.

GONIOBASIS BIFASCIATA. Pl. 54, fig. 7.

Testa plicata, aliquando striata, subcrassa, luteola, bifasciata; spira obtusa, valde plicata; suturis irregulariter impressis; anfractibus instar senis, planulatis; apertura parviuscula, subrotunda, intus albida; labro acuto, parum sinuoso; columella albida et contorta.

Shell plicate, sometimes striate, somewhat thick, yellowish, double banded; spire obtuse, much plicate; sutures irregularly impressed; whorls about six, flattened; aperture rather small, subrotund, whitish within; outer lip acute, somewhat sinuous; columella whitish and twisted.

Proc. Acad. Nat. Sci., 1868, p. 151.

Hab.—Jackson County, Alabama, Dr. Spillman.

My cabinet and cabinet of Dr. Spillman.

Diam. ·25, Length ·54 inch.

Remarks.—This pretty little species, if we may judge of the three specimens before me, is very persistent in its characters. The two wide bands and the yellow epidermis, with the strong folds, seem to distinguish it well from other species. There are about eleven rather strong ribs on each whorl. It is somewhat like *formosa*, Con., but it differs from the figure and description in not "having two proximate, prominent lines on the summit of each whorl." He does not mention the bands, but his figure gives one. The aperture is full one-fourth the length of the shell.

GONIOBASIS CLATHRATA. Pl. 54, fig. 8.

Testa plicata et striata, pyramidata, tenui, dilute cornea, efasciata; spira exserta, acuminata; suturis impressis; anfractibus octonis, convexiusculis; apertura parviuscula, rhomboidea, intus vel albida vel purpurea; labro crenulato, subsinuoso; columella valde contorta.

Shell plicate and striate, pyramidal, thin, pale horn color, without bands; spire exserted, pointed; sutures impressed; whorls eight, a little convex; aperture rather small, rhomboidal, purple or white within; outer lip crenulate, subsinuous; columella very much twisted.

Proc. Acad. Nat. Sci., 1868, p. 151.

Hab.—Jackson County, Alabama, Dr. Spillman.

My cabinet and cabinet of Dr. Spillman.

Diam. ·38, Length 1·5 inch.

Remarks.—Out of seven specimens before me only one is full grown, being over an inch in length. The stria are close and numerous, covering the whole of the whorls. The ribs, which are numerous, are curved and decussate the striæ. These ribs come down to the last stria and there terminate, not reaching the suture. Between the striæ the surface is disposed to be crimpled. Three out of the seven specimens are purplish inside. It is very like *glauca,* Anth., but is not so large, and the ribs and striæ cover the whole of the whorls, which is not the case with *glauca.* The aperture is not quite one-third the length of the shell.

GONIOBASIS GOULDIANA.* Pl. 54, fig. 9.

Testa plicata, subturrita, subtenui, rufo-cornea, vittata; spira elevata; suturis irregulariter impressis; anfractibus instar novenis, convexiusculis; apertura parviuscula, ovata, intus albida; labro acuto; columella inflexa et tortuosa.

Shell plicate, subturrited, rather thin, reddish-horn color, banded; spire raised; sutures irregularly impressed; whorls about nine, a little convex; aperture rather small, ovate, whitish within; outer lip acute; columella inflected and twisted.

G. pulchella. Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—North Alabama, Dr. Spillman.

My cabinet.

Diam. ·24, Length ·64 inch.

Remarks.—This pretty little species unfortunately came represented by two imperfect specimens. The aperture of both is broken, but the remaining parts are very perfect. The ribs are strongly marked and consist of nine on each whorl. There are four bands well defined and are stronger outside than in, which is unusual. On the upper part of the whorl there is a light band immediately under the suture, which contrasts with the reddish-horn color of the other parts. The aperture is rather less than one-third the length of the shell.

GONIOBASIS LUTEOCELLA. Pl. 54, fig. 10.

Testa plicata et striata, fusiformi, subcrassa, ochracea, vittata vel evittata; spira brevi; suturis irregulariter impressis; anfractibus quinis, convexiusculis; apertura grandi, ovata, intus luteo-alba; labro acuto; columella superne incrassata et valde contorta.

Shell plicate and striate, fusiform, somewhat thick, ochraceous, banded or without bands; spire short; sutures irregularly impressed; whorls five, somewhat convex;

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* Having unintentionally used Dr. Gould's name, *pulchella,* I change it to *Gouldiana,* in honor of my friend.

aperture large, ovate, within yellowish-white; outer lip acute; columella thickened above and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 151.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie, and Oconee River, Rev. G. White.

My cabinet and cabinets of Dr. Hartman, Academy of Natural Sciences and Mr. Wheatley.

Diam. ·35, Length ·67 inch.

Remarks.—Quite a number of this species were sent to me by Major Downie. It belongs to the group of which *flavescens* is the type, but it is shorter and has a larger aperture. It cannot be confounded with *tenebrosa,* herein described, although it is nearly of the same outline. That species is striate all over, has a larger aperture, a less curved columella and is purple within, while *luteocella* has usually four bands, or is entirely without bands. In outline it is somewhat like *Mel.* (*Gon.*) *auriculaformis* (nobis), but that is a smaller species, with a shorter spire and smooth. They cannot be mistaken for each other. Some of the specimens are more striate than others, and some are darker from having purple bands, which are well defined inside. The aperture is nearly two-thirds the length of the shell.

GONIOBASIS CONNESAUGAENSIS. Pl. 54, fig. 11.

Testa plicata, inferne striata, subfusiformi, subtenui, vel mellea vel ochracea vel tenebroso-fusca, nitida; spira conoidea; suturis impressis; anfractibus septenis, planulatis; apertura subconstricta, rhomboidea, intus luteola vel tenebroso-fusca; labro acuto; columella inflexa et tortuosa.

Shell plicate, striate below, subfusiform, rather thin, honey-yellow, either ochraceous or dark brown, shining; spire conical; sutures impressed; whorls seven, flattened; aperture somewhat constricted, rhomboidal, yellowish within or dark brown; outer lip acute; columella inflected and twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet.

Diam. ·38, Length ·72 inch.

Remarks.—The three specimens before me are all of different colors, while the outline, folds and striæ are exactly the same. The dark one has its color from the dark bands, which run together and thus make the whole a very dark brown. The folds are low and distant, and occupy the upper half of all the whorls, and the transverse striæ occupy, with great regularity, the lower half. The lower whorl has about seven folds, which are here merely slight irregular risings of the surface. It is remarkable that one specimen should be covered with confluent bands and the other two be bandless. The outline of this species is very nearly the same as that of

Bridgesiana (nobis), but it differs entirely in having folds and striæ, which are peculiar. The aperture is more than one-third the length of the shell.

Goniobasis contigua. Pl. 54, fig. 12.

Testa lævi, subfusiformi, tenui, tenebroso-oliva, evittata; spira subelevata; suturis impressis; anfractibus instar quinis, convexiusculis; apertura grandi, subrhombica, intus albida; labro acuto, sinuoso; columella vix incrassata et valde contorta.

Shell smooth, subfusiform, thin, dark olive, without bands; spire somewhat raised; sutures impressed; whorls about five, somewhat convex; aperture large, subrhomboidal, whitish within; outer lip acute, sinuous; columella scarcely thickened and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet.

Diam. ·37, Length ·80 inch.

Remarks.—Unfortunately only a single specimen was received, and that imperfect in the upper whorls. It is in outline nearest to *Christyi* (nobis), but differs in not being plicate or granose and is a thinner shell, with a sharp angle at the base. There are a few obscure striæ on the middle and lower part of the last whorl. The aperture is about half the length of the shell.

Goniobasis Murrayensis. Pl. 54, fig. 13.

Testa lævi, fusiformi, inflata, subtenui, tenebroso-cornea, evittata; spira conoidea, ad apicem plicata; suturis aliquanto impressis: anfractibus instar senis, subplanulatis; apertura magna, subrhomboidea, intus luteola; labro acuto, parum sinuoso; columella inflexa et tortuosa.

Shell smooth, fusiform, inflated, rather thin, dark horn color, without bands; spire conoidal, folded at the tip; sutures somewhat impressed; whorls about six, rather flattened; aperture large, subrhomboidal, yellowish within; outer lip acute, somewhat sinuous; columella inflected and twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Swamp Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet and cabinets of Academy of Natural Sciences, Mr. Wheatley and Dr. Hartman.

Diam. ·48, Length ·95 inch.

Remarks.—Quite a number of this species were sent to me by Major Downie. Some of them are darker in the epidermis than others. In regard to the folds which appear on nearly all the specimens in the younger stage, they are in some of them quite well pronounced as low as the third or fourth whorl. This species has a strong resemblance to *Bridgesiana* (nobis), but may be distinguished by its longer spire, its darker color and being less fusiform. The color of the interior also differs, the *Murrayensis* being of a yellowish tint. The aperture is rather more than one-third the length of the shell.

GONIOBASIS GRANATOIDES. Pl. 54, fig. 14.

Testa granulata, inferne striata, subfusiformi, subtenui, cornea; spira conoidea, ad apicem plicata; suturis impressis; anfractibus instar senis, vix convexis; apertura subgrandi, ovata; intus luteo-alba; labro acuto; columella tortuosa.

Shell granulate, striate below, subfusiform, somewhat thin, horn color; spire conoidal, plicate at the tips; sutures impressed; whorls about six, scarcely convex; aperture rather large, ovate, yellowish-white within; outer lip acute; columella twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie.

My cabinet and cabinets of Dr. Hartman, C. M. Wheatley and Academy of Natural Sciences.

Diam. ·45, Length ·85 inch.

Remarks.—This species is nearly the same in outline with *granata* (nobis), but differs in being a larger species, more horn colored and being without bands. In the aperture it is wider at the base, the fuse being larger. Like *Tryoniana* (nobis), it has numerous though not so many granules, and it differs in the aperture. The young specimens have well formed folds on the upper whorls. The aperture is about one-half the length of the shell.

GONIOBASIS CLAVULA. Pl. 54, fig. 15.

Testa carinata, aliquando plicata, tenui, tenebroso-castanea, efasciata; spira exserta, acuminata; suturis regulariter impressis; anfractibus instar octonis, planulatis; apertura parvissima, ovata, intus castanea; labro acuto; columella alba et contorta.

Shell carinate, sometimes plicate, thin, dark chestnut-brown, without bands; spire exserted, acuminate; sutures regularly impressed; whorls about eight, flattened; aperture, very small, ovate, within chestnut color; outer lip acute; columella white and twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Jackson Co., Alabama, Dr. Spillman.

My cabinet and cabinets of the Academy of Natural Sciences and Mr. Wheatley.

Diam. ·17, Length ·52 inch.

Remarks.—A number of specimens were received, all nearly of the same size. It is a very small species, and somewhat like *Clarkii* (nobis), but it is rather more cylindrical. Some specimens have scarcely the rudiments of folds, while others have them down to the last whorl. Some have striæ on the lower part of the whorl. The aperture is about one-fourth the length of the shell.

GONIOBASIS COCHLIARIS. Pl. 54, fig. 16.

Testa carinata et striata, cylindracea, tenui, tenebroso-fusca, evittata; spira attenuata; suturis valde impressis; anfractibus instar novenis, ad apicem valde carinatis, inferne striatis; apertura parvissima, late elliptica, intus tenebrosa; labro subcrenato; columella inflexa, ad basim incrassata.

Shell carinate and striate, cylindrical, thin, dark brown and without bands; spire attenuate; sutures very much impressed; whorls about nine, very much carinate at the beaks, striate below; aperture very small, widely elliptical, dark within; outer lip subcrenate; columella inflected, thickened at the base.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Shelby Co., Alabama, Major T. C. Downie.

My cabinet and cabinet of the Academy of Natural Sciences.

Diam. ·14, Length ·59 inch.

Remarks.—This little cylindrical species is near to *rubella* (nobis), but may at once be distinguished by its gimlet-like form, which is very remarkable, being almost exactly the same with the point of that instrument. There are usually five well-defined striæ on each specimen, and that on the middle of the whorls is so large as to make the shell carinate. Above this carina on the upper whorls there is a chain of bead-like nodes. The basal striæ inside are disposed to be purplish. The aperture is about the fifth of the length of the shell.

GONIOBASIS VENUSTA. Pl. 54, fig. 17.

Testa subcarinata, conoidea, subtenui, mellea, evittata; spira elevata; suturis regulariter impressis; anfractibus planulatis, instar septenis; apertura parva, rhomboidea, intus albida; labro acuto; columella inflexa et valde contorta.

Shell subcarinate, conoidal, rather thin, honey-yellow, without bands; spire elevated; sutures regularly impressed; whorls flattened, about seven; aperture small, rhomboidal, whitish within; outer lip acute; columella inflected and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Coosa River, Alabama, Dr. Showalter.

My cabinet.

Diam. ·32, Length ·75 inch.

Remarks.—A single specimen only is before me, and it appears not to be entirely mature. It has some resemblance to a young *robusta* (nobis), but it is a more slender shell and has a small carina above the middle of the whorl. Below this carina there are two or three rather indistinct striæ. It has a very graceful form and polished surface. The aperture is not quite one-third the length of the shell.

GONIOBASIS ORNATA. Pl. 54, fig. 18.

Testa carinata, subturrita, tenui, olivacea, valde vittata; spira elevata, superne plicata; suturis valde impressis; anfractibus septenis, planulatis; apertura parviuscula, subrhomboidea, intus vittata; labro acuto, aliquanto sinuoso; columella vix incrassata et valde contorta..

Shell carinate, somewhat turrited, thin, olivaceous, very much banded; spire elevated, plicate above; sutures very much impressed; whorls seven, flattened; aperture rather small, subrhomboidal, banded within; outer lip acute, somewhat sinuous; columella scarcely thickened and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Connesauga Creek, Whitfield Co., Geo., Major T. C. Downie.

My cabinet.

Diam. ·36, Length ·84 inch.

Remarks.—Five specimens are before me, only one being mature. It is a pretty species, with a varying number of bands, which are very distinct within the aperture, there being four, five or six in those before me. The upper whorls are indistinctly plicate. It belongs to the group of which *Gerhardtii* (nobis) may be considered to be the type. It differs from it in being less robust, in being carinate and being a smaller species. It has some resemblance to *mutabilis* (nobis), which is sometimes carinate and plicate, but it differs much in the aperture of that shell. The aperture is quite one-third the length of the shell.

TRYPANOSTOMA NUCIFORME. Pl. 54, fig. 19.

Testa lævi, obtuse conica, inflata, crassiuscula, castanea; spira brevi, obtusa; suturis regulariter impressis; anfractibus instar quinis, convexiusculis; apertura magna, rhomboidea; labro acuto, expanso, sinuoso; columella inflexa et valde tortuosa.

Shell smooth, obtusely conical, inflated, slightly thickened, chestnut-colored; spire short, obtuse; sutures regularly impressed; whorls about five, a little convex; aperture large, rhomboidal; outer lip acute, expanded and sinuous; columella inflected and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Connesauga Creek, Whitfield Co., Geo., Major T. C. Downie.

My cabinet.

Diam. ·34, Length ·59 inch.

Remarks.—A single specimen only was among the shells kindly sent to me from the north of Georgia by Major Downie. It is very nearly the size, form and color of the fruit of the Chincapin (*Castanea pumila*). While it is closely allied to *Tennesséense* (nobis), it may be distinguished by its lighter color, its longer fuse, and its less indented outer lip. The lower part of the outer lip is much less prolonged. The aperture is quite half the length of the shell.

TRYPANOSTOMA CASTANEUM. Pl. 54, fig. 20.

Testa lævi, pyramidata, subtenui, castanea, obsolete fasciata; spira exserta, acuminata; suturis impressis; anfractibus instar novenis, planulatis; apertura parviuscula, rhomboidea, intus dilute purpurea; labro acuto, sigmoideo; columella parum incrassata et valde contorta.

Shell smooth, pyramidal, rather thin, chestnut-brown, obscurely banded; spire exserted, acuminate; sutures impressed; whorls about nine, flattened; aperture rather small, rhomboidal, pale purple within; outer lip acute, sigmoid; columella somewhat thickened and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 152.

Hab.—Coosa River, Alabama, Dr. Showalter.

My cabinet and cabinet of Dr. Showalter.

Diam, ·35, Length ·99 inch.

Remarks.—There were five specimens received from Dr. Showalter, differing very little in size or color. The purplish color of the aperture is caused by irregular subcapillary bands, which pervade the whole interior surface. The apices of all the specimens are eroded, and therefore I am unable to say whether the upper whorls might be striate or not; but there is no appearance of striation. In outline this species is very near to *Christyi* (nobis) and *Whitei* (nobis), but may easily be distinguished by the color inside and out. The channel is rather narrower and more tortuous than in either. The aperture is about three-tenths the length of the shell.

TRYPANOSTOMA WHEATLEYI. Pl. 54, fig. 21.

Testa lævi, pyramidata, tenui, dilute rubiginosa, vel fasciata vel efasciata; spira exserta, acuminata; suturis regulariter impressis; anfractibus instar denis, planulatis, ad apicem carinatis; apertura parviuscula, rhomboidea, intus albida; labro acuto, sigmoideo; columella ad basim parum incrassata et valde contorta.

Shell smooth, pyramidal, thin, pale rubiginose, banded or without bands; spire exserted, acuminate; sutures regularly impressed; whorls about ten, flattened, carinate at the tip; aperture rather small, rhomboidal, whitish within; outer lip acute, sigmoid; columella slightly thickened at the base and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—Coosa River, Alabama, Dr. Showalter.

My cabinet and cabinets of Dr. Showalter and Mr. Wheatley.

Diam. ·32, Length ·83 inch.

Remarks.—Mr. Wheatley received three specimens from Dr. Showalter, which he kindly sent to me. In outline it is almost identical with *mucronatum* (nobis), but differs in the form of the channel, being not quite so much recurved at the base. It also differs entirely in color, being rubiginose, while *mucronatum* is of a pale horn color. The upper whorls are sharply carinate and the lower whorl is obtusely angular on the middle. One of the three specimens before me has two obscure bands, the others are without bands. The aperture is not quite one-third the length of the shell. I have great pleasure in naming this after my friend C. M. Wheatley, Esq., who has done so much for this branch of Natural History, and to whom I am indebted for the specimens.

TRYPANOSTOMA TEREBRALE. Pl. 54, fig. 22.

Testa lævi, pyramidata, tenui, olivacea, vel vittata vel evittata; spira valde exserta; suturis valde impressis; anfractibus instar duodenis, planulatis, ad apicem carinatis; apertura parviuscula, rhomboidea, intus albida vel vittata; labro acuto, sinuoso; columella impressa et valde contorta.

Shell smooth, pyramidal, thin, olivaceous, banded or not banded; spire very much exserted; sutures very much impressed; whorls about twelve, flattened, carinate at the tip; aperture rather small, rhomboidal, whitish within or banded; outer lip acute, sinuous; columella impressed and very much twisted.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—Jackson County, Alabama, W. Spillman.

My cabinet.

Diam. ·44, Length 1·40 inch.

Remarks.—One adult and four younger specimens were received from Dr. Spillman. All the specimens are thin and light. Two are without bands, the other three have five to seven bands, which are strong in color in the inside. These fine specimens differ very much in appearance, some being more carinate than others and some being without bands. The channel at the base is remarkably wide. In outline it is allied to *M.* (*Try.*) *elongata* (nobis), but more closely to *M.* (*Try.*) *Brumbyi* (nobis). It is not so solid and smooth as the former, nor is it striate and dark colored like the latter. Only one has the apex whole, but this shows that the number of whorls must be at least twelve. The angle of the body whorl on one specimen is quite sharp. The aperture is not quite one-fourth the length of the shell.

LITHASIA PURPUREA. Pl. 54, fig. 23.

Testa lævi, curta, subcylindracea, subcrassa, tenebroso-purpurea; spira brevissima; suturis valde impressis; anfractibus instar quinis, convexiusculis; apertura grandi, rhomboidea, intus saturale purpurea; labro acuto, vix sinuoso; columella impressa, superne incrassata.

Shell smooth, short, subcylindrical, somewhat thick, dark purple; spire very short; sutures very much impressed; whorls about five, somewhat convex; aperture large, rhomboidal, pale purple within; outer lip acute, slightly sinuous; columella impressed, thickened above.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—Cahawba River, at Centreville, Bibb County, Alabama, Dr. Showalter.

My cabinet and cabinets of Dr. Showalter, Mr. Wheatley and Dr. Hartman.

Diam. ·47, Length ·70 inch.

Remarks.—Dr. Showalter sent me at two different times, many years since, two specimens of this shell. I then thought it might be a variety of *Showalterii* (nobis). Recently I have received from him two other specimens, larger and older, which satisfy me that he was right in supposing the species to be new. The largest specimen before me has little more than the last whorl perfect. The youngest has the spire nearly perfect. The throat of the shell is intensely purple. This species having no thickening at the base of the columella allies it closely to the genus *Anculosa*, but it is not rounded at the base as that genus is and it is not so oblique. The aperture is about two-thirds the length of the shell.

LITHASIA CURTA. Pl. 54, fig. 24.

Testa granulata, curta, solida, luteo-olivacea, plerumque bifasciata; spira brevi; suturis irregulariter impressis; anfractibus instar quinis, planulatis; apertura subgrandi, rhomboidea, intus albida; labro acuto, subsinuoso; columella inferne et superne incrassata.

Shell granulate, short, solid, yellowish-olive, usually double banded; spire short; sutures irregularly impressed; whorls about five, flattened; aperture rather large, rhomboidal, whitish within; outer lip acute, somewhat sinuous; columella thickened above and below.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—North Alabama, Prof. Tuomey and Dr. Spillman, and Tuscumbia, B. Pybas.

My cabinet and cabinets of the Academy of Natural Sciences and Mr. Wheatley.

Diam. ·40, Length ·60 inch.

Remarks.—This is a rather small species, which has been confounded with *semigranulata*, Desh.; but it is a smaller species, has fewer granules, is not so elevated in the spire and is usually more regularly banded. The specimens from Prof. Tuomey have been in my collection many years as a variety of *semigranulata*, but specimens recently received from Dr. Spillman satisfy me that the species is distinct. *Curta* has usually two bands, well defined inside and out. On the upper band there is usually a complete row of granules, and just below this row a less well developed row of granules above the lower band. In some specimens there is a disposition to three rows and sometimes there are only a few small granules. The aperture is usually more than one-half the length of the shell.

LITHASIA WHEATLEYI. Pl. 54, fig. 25.

Testa lævi, subcylindracea, luteo-virente, vittata; spira elevata; suturis irregulariter impressis; anfractibus planulatis, ultimo subgrandi; apertura subconstricta, rhomboidea, intus vittata; labro acuto, sinuoso; columella alba et valde sinuosa.

Shell smooth, subcylindrical, greenish-yellow, banded; spire elevated; sutures irregularly impressed; whorls flattened, the last one rather large; aperture rather constricted, rhomboidal, banded within; outer lip sharp, sinuous; columella white and very sinuous.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Cahawba River, Alabama, E. R. Showalter, M. D.

My cabinet and cabinets of Dr. Showalter and Mr. Wheatley.

Diam. ·40, Length ·85 inch.

Remarks.—This fine species is allied to *Downiei* (nobis) but differs in being smaller, being less cylindrical and in not possessing any tubercles. In the columella *Wheatleyi* is more incurved and has a more decided turn at the base, which nearly amounts to a fold, and the channel is more pronounced. The two specimens of *Wheatleyi* before me have each four well defined bands. In the three specimens of *Downiei* one has six, another has five and the third has no bands. The spire being imperfect the number of whorls is not ascertained. I dedicate this fine species to Mr. C. M. Wheatley, at the request of Dr. Showalter, with great pleasure.

LITHASIA CYLINDRICA. Pl. 54, fig. 26.

Testa striata, cylindracea, flavescente, vittata vel evittata; spira subelevata; suturis irregulariter impressis; anfractibus constrictis, ultimo grandi; apertura subconstricta, rhomboidea; labro acuto, sinuoso; columella alba et valde sinuosa.

Shell striate, cylindrical, yellowish, banded or without bands; spire somewhat raised; sutures irregularly impressed; whorls constricted, the last one large; aperture rather constricted, rhomboidal; outer lip sharp, sinuous; columella white and very much sinuate.

Proc. Acad. Nat. Sci. 1866, p. 133.

Hab.—Coosa River, Alabama, E. R. Showalter, M. D.

My cabinet and cabinets of Dr. Showalter and C. M. Wheatley.

Diam. ·40, Length ·80 inch.

Remarks.—This species, of which there are four specimens before me, is nearly allied to *Wheatleyi* (nobis), herein described. It differs in being more yellow, in being striate and being more cylindrical. The bands are not so well pronounced inside or out. Three of the specimens are four-banded; the fourth entirely without bands on the inside. There is a slight disposition to yellowishness in the interior. All the specimens being eroded at the tips the number of the whorls cannot be ascertained.

SCHIZOSTOMA WHEATLEYI. Pl. 54, fig. 27.

Testa striata, subfusiformi, subtenui, luteola, imperforata, vittata; spira obtuso-conoidea; suturis irregulariter impressis; anfractibus instar senis, ultimo grandi; fissura obliqua brevique; apertura parviuscula, ovata, intus alba et vittata; labro subcrenulato; columella alba incrassata et contorta.

Shell striate, subfusiform, rather thin, yellowish, imperforate, banded; spire obtusely conoidal; sutures irregularly impressed; whorls about six, the last large; fissure oblique and short; aperture rather small, ovate, white and banded within; outer lip somewhat crenulate; columella white, thickened and twisted.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—Coosa River, Dr. Showalter.

My cabinet and cabinet of Dr. Showalter.

Diam. ·35, Length ·70 inch.

Remarks.—A single specimen only was received from Dr. Showalter, to whom I have been indebted for so many species of this genus. In outline it is very close to *S. excisa* (nobis), as well as in color, bands and striæ; but it differs entirely in the fissure, which in *Wheatleyi* is shallow and oblique, while in *excisa* it is deep and direct. There are four bands on this specimen, which show distinctly on the inside. The aperture is not half the length of the shell.

I name this species after my friend Mr. C. M. Wheatley, who has greatly promoted the knowledge of our fresh-water *Mollusca.*

ANCULOSA DOWNIEI. Pl. 54, fig. 28.

Testa plicata, et obsolete striata, subglobosa, crassa, tenebroso-oliva, maculata; spira vix prominulis, plicatis; suturis impressis; anfractibus vix ternis, ultimo grandi et ventricoso; apertura grandi, subrotunda, intus fusco-maculata; labro acuto; columella impressa et incrassata.

Shell plicate and obscurely striate, subglobose, thick, dark olive, spotted; spire very little prominent, folded; sutures impressed; whorls scarcely three, the last large and ventricose; aperture large and subrotund, within brown spotted; outer lip acute; columella impressed and thickened.

Proc. Acad. Nat. Sci. 1868, p. 153.

Hab.—Connesauga Creek, Whitfield County, Georgia, Major T. C. Downie, and Coosa River, Alabama, Dr. Showalter.

My cabinet and cabinets of Dr. Showalter, Dr. Hartman and Mr. Wheatley.

Diam. ·45, Length ·51 inch.

Remarks.—Quite a number of specimens were sent to me by Major Downie, and one from the Coosa River by Dr. Showalter. This species seems to be more uniform than usual among *Anculosæ.* Among nearly one hundred specimens scarcely any are found to differ essentially. There are eight or ten short low folds on the upper part of the whorls, and obscure transverse revolving striæ, which cover the whole of the body whorl. The brown spots, which are really interrupted bands, cover the whorls inside and out. It is allied in form to *picta* and *gibbosa* (nobis), but need not be confounded with either. I have pleasure in dedicating this species to Major T. C. Downie, who has brought to our knowledge so many interesting *Mollusca* from Georgia.

PALUDINA SPILLMANII. Pl. 54, fig. 29.

Testa transverse et exillissime striata, obtuse carinata, subelliptica, subtenui, imperforata; spira aliquanto exserta; suturis impressis; anfractibus quinis, subinflatis; apertura parviuscula, ovata, intus cæruleo-alba; labro acuto, parum sinuoso; columella parum incrassata.

Shell transversely and closely striate, obtusely carinate, subelliptical, rather thin, imperforate; spire somewhat raised; sutures impressed; whorls five, somewhat inflated; aperture rather small, ovate, bluish-white within; outer lip acute, somewhat sinuous; columella somewhat thickened.

Proc. Acad. Nat. Sci. 1867, p. 81.

Hab.—Jackson County, Alabama, W. Spillman, M. D.

My cabinet and cabinet of Dr. Spillman.

Diam. ·51, Length 1·3 inch.

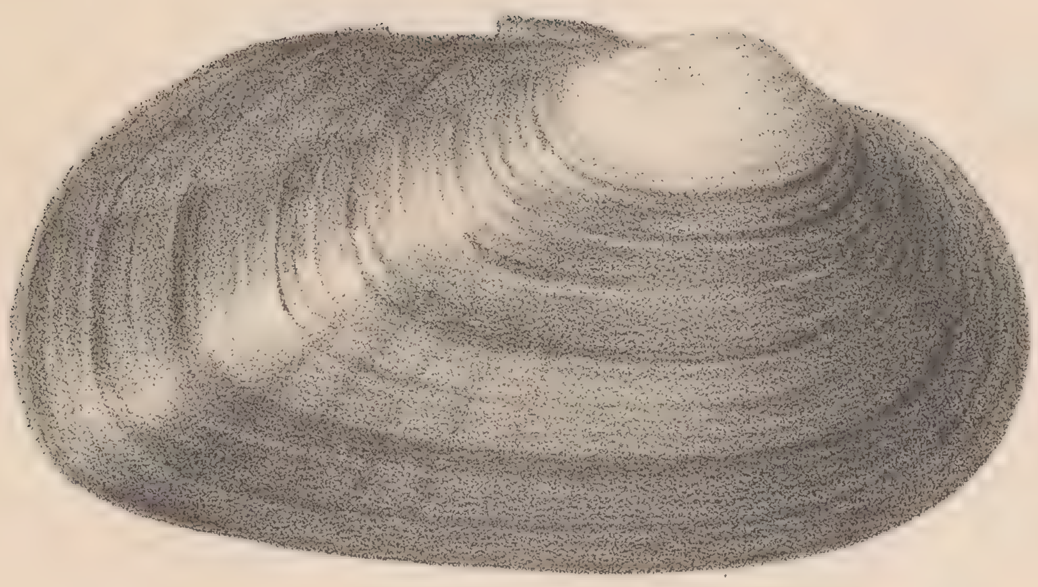
Remarks.—Four specimens were sent to me by Dr. Spillman, all of different ages. In general characters this species is most like *subcarinata*, Say. It has nearly the same carination on the upper whorls, which carination is obsolete on the last whorl. On all these specimens there are transverse striæ on the upper part of the whorls. It differs from *subcarinata* in being longer and more fusiform, and the mouth is rather more expanded. I am glad to call it after Dr. Spillman, to whom I owe the possession of this and many other new shells from the State of Mississippi.

INDEX.

PAGE.
Unio acutirostris, 30
" amabilis, 17
" ampullaceus, 29
" apprimus, 23
" asperulus, 40
" Beaverensis, 57
" Bisselianus, 37
" Brazosensis, 69
" Chinensis, 85
" Clinchensis, 38
" consanguineus, 87
" Copei, 67
" corvinus, 70
" corvunculus, 74
" Cromwellii, 18
" cylindrellus, 68
" datus, 59
" difficilis, 71
" doliaris, 20
" dorsatus, 60
" Emesaensis, 14
" encarpus, 54
" evitatus, 39
" fassinans, 65
" firmus, 27
" Gabbianus, 55
" genuinus, 64
" Granadensis, 53
" granulatus, 87
" Homsensis, 9
" humerosus, 61
" Jewettii, 36
" Kullethensis, 11
" Lewisii, 87
" locellus, 24
" Lincecumii, 72
" Lyonii, 19
" Mardinensis, 12
" marginis, 15
" Murrayensis, 62
" Nicaraguensis, 56
" nubilus, 58
" Orphaensis, 10
" Ortonii, 81
" Paraguayensis, 31
" parcus, 22
" Pawensis, 62
" peculiaris, 25
" pilatus, 41
" planior, 76
" pliciferus, 86
" proprius, 16
" protensus, 16
" prunoides, 83
" punctatus, 21
" refulgens, 77

PAGE.
Unio rufofuscus, 42
" rugososulcatus, 26
" Siamensis, 39
" sparus, 66
" sphæricus, 79
" Strebelii, 78
" Topekaensis, 73
" tortuosus, 46
" Uharéensis, 63
" umbrosus, 86
" vallatus, 75
" Veracruzensis, 80
" Wrightii, 43
Anodonta Bridgesii, 51
" Granadensis, 48
" inæquivalva, 52
" Jewettii, 49
" lenticularis, 50
" Napoensis, 84
" Pazii, 34
" Strebelii, 82
" Youkanensis, 47
Margaritana Holstonia, 87
Monocondylœa lentiformis, 32
" Mardinensis, 12
" Pazii, 33
Mycetopus pygmæus, 35
Goniobasis arata, 89
" bifasciata, 91
" clavula, 95
" clathrata, 91
" cochliaris, 96
" Connesaugaensis, 93
" contigua, 94
" Gesnerii, 90
" Gouldiana, 92
" granatoides, 95
" luteocella, 92
" Murrayensis, 94
" ornata, 97
" similis, 88
" sulcata, 89
" venusta, 96
" Wheatleyi, 88
" Whitfieldensis, 80
Trypanostoma castaneum, 98
" nuciforme, 97
" terebrale, 99
" Wheatleyi, 98
Lithasia curta, 100
" cylindrica, 101
" purpurea, 100
" Wheatleyi, 101
Schizostoma Wheatleyi, 102
Anculosa Downiei, 102
Paludina Spillmanii, 103

64.



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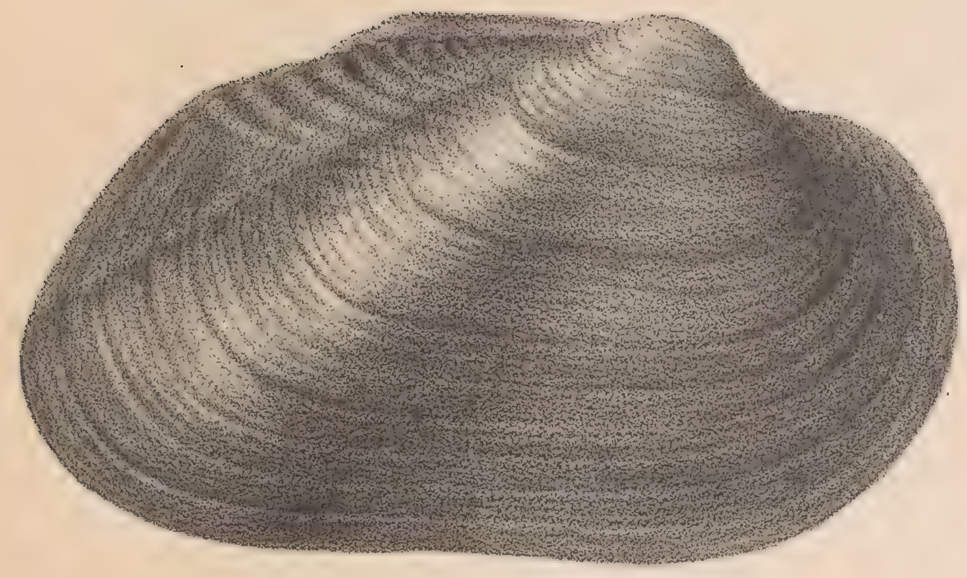

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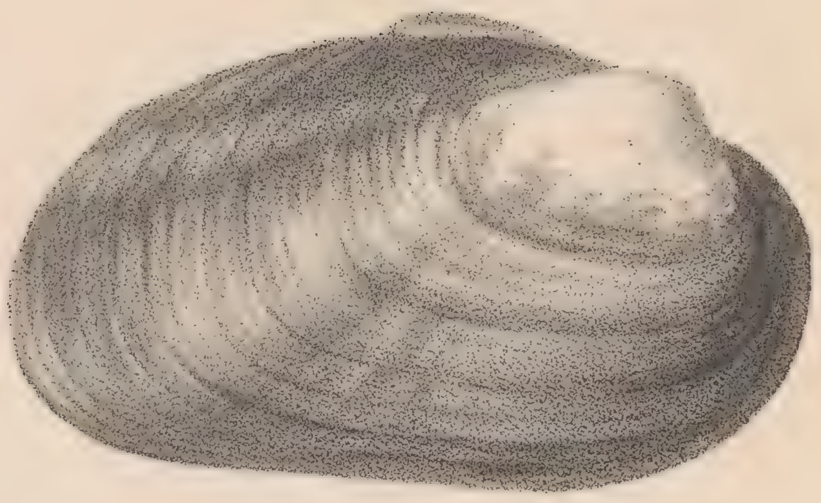
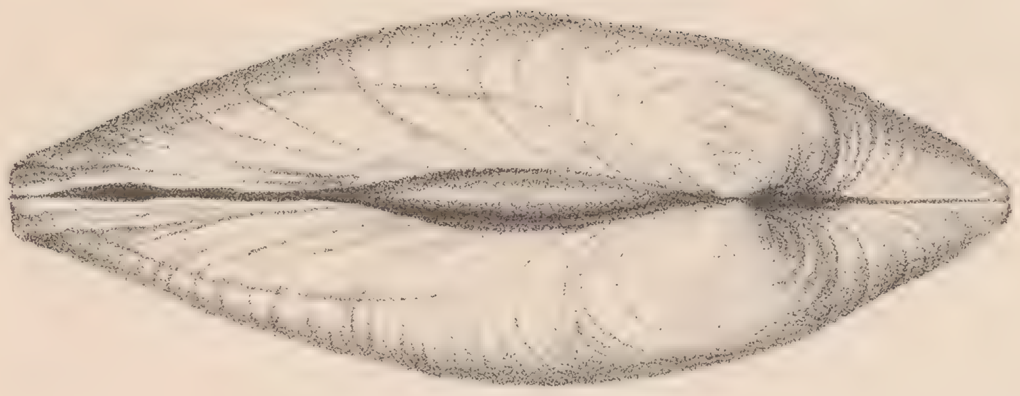
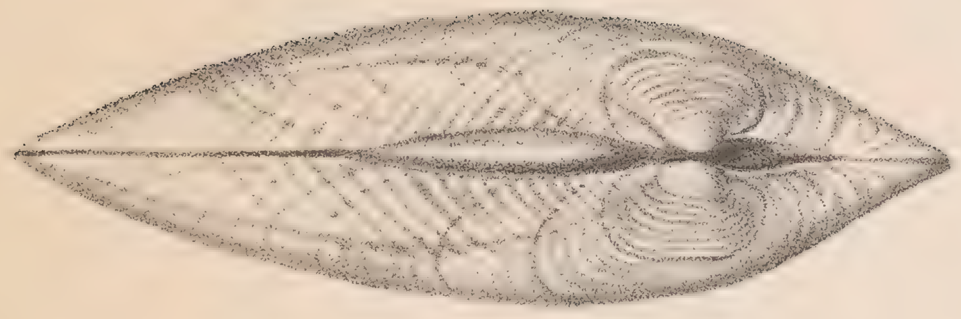
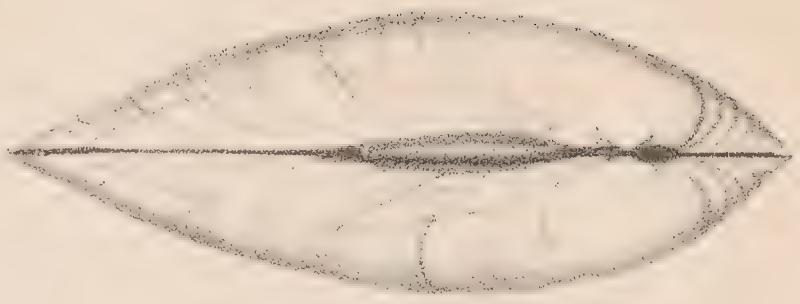
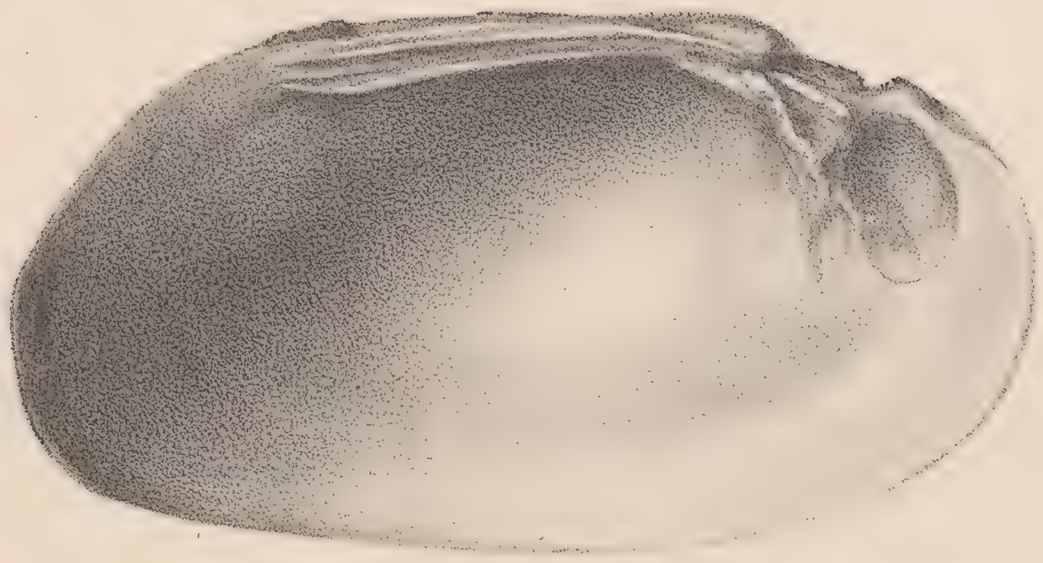
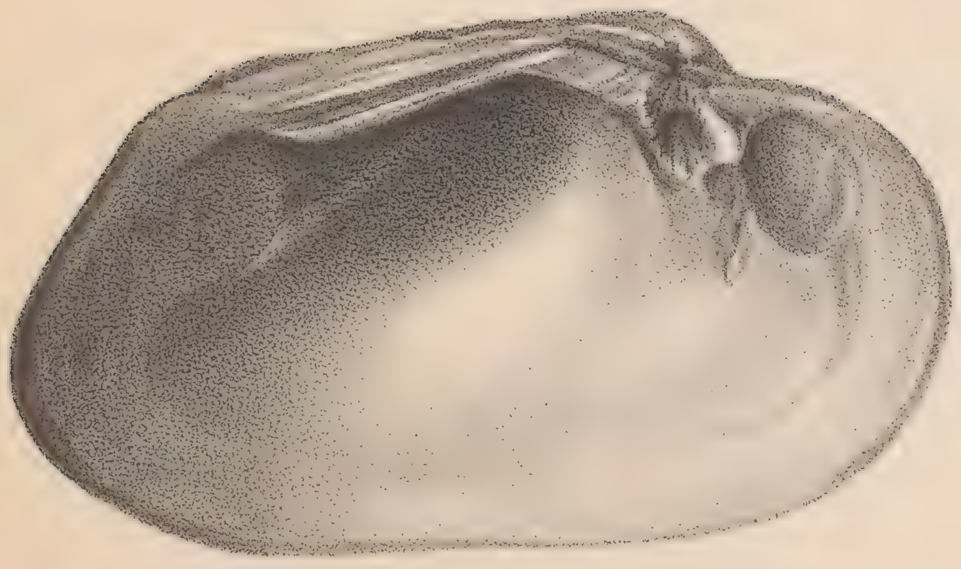


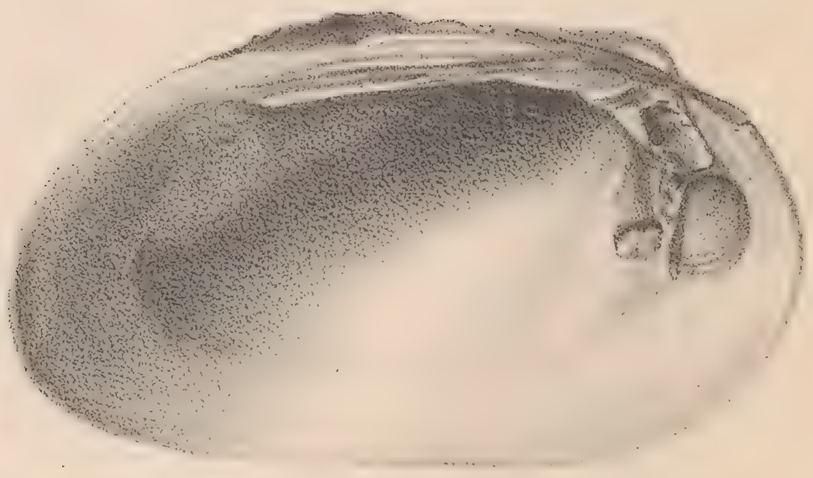








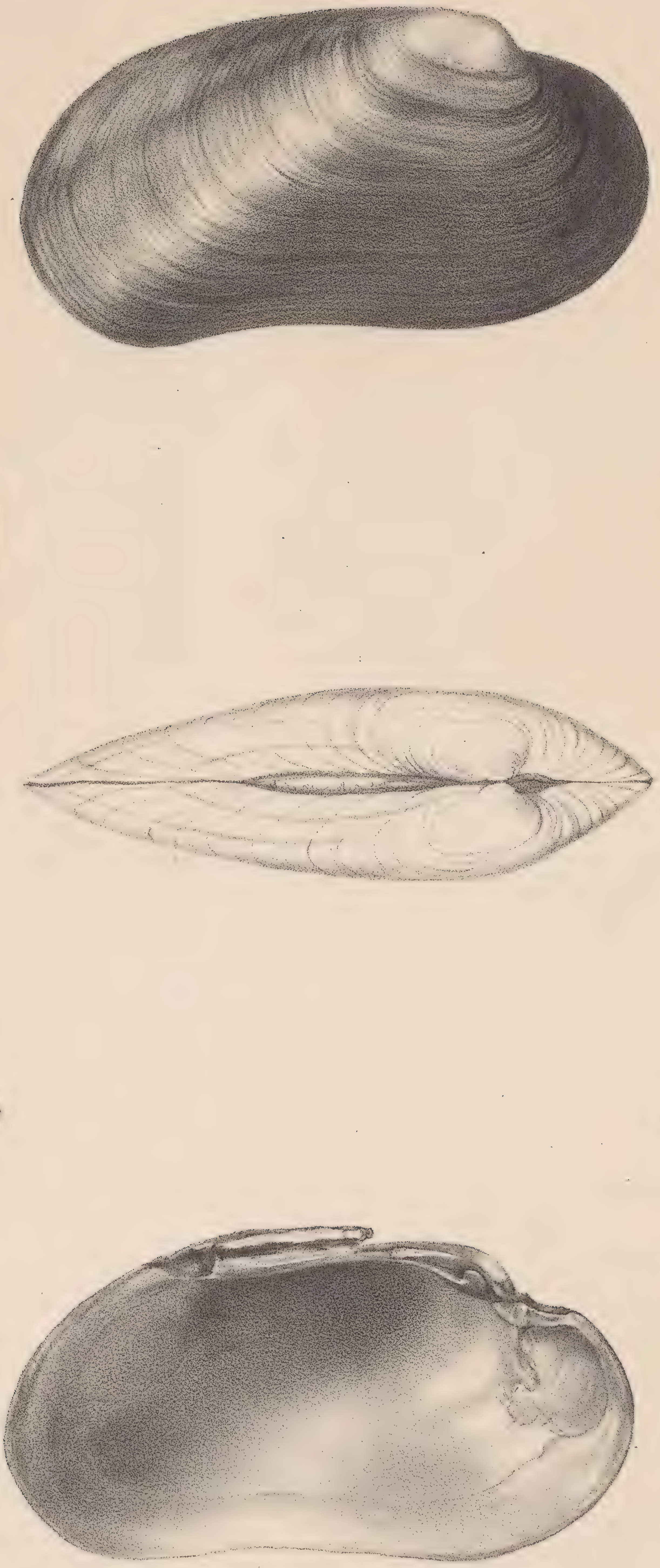




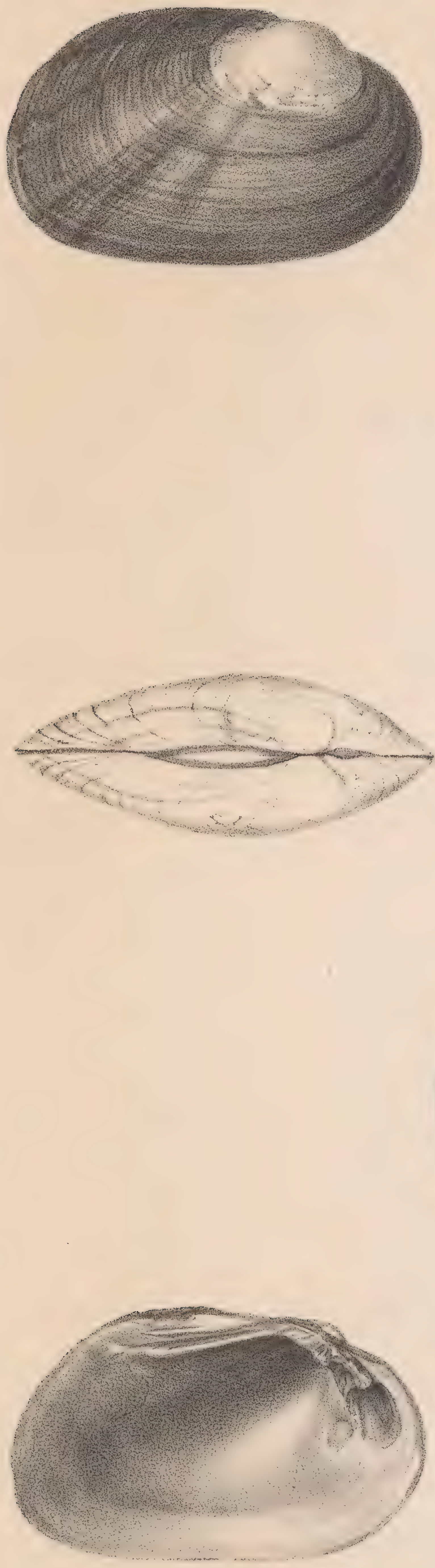
63. *Unio Homsensis.*
64. *Unio Orphaensis.*
65. *Unio Kullethensis.*

T. Sinclair's lith. Phil.

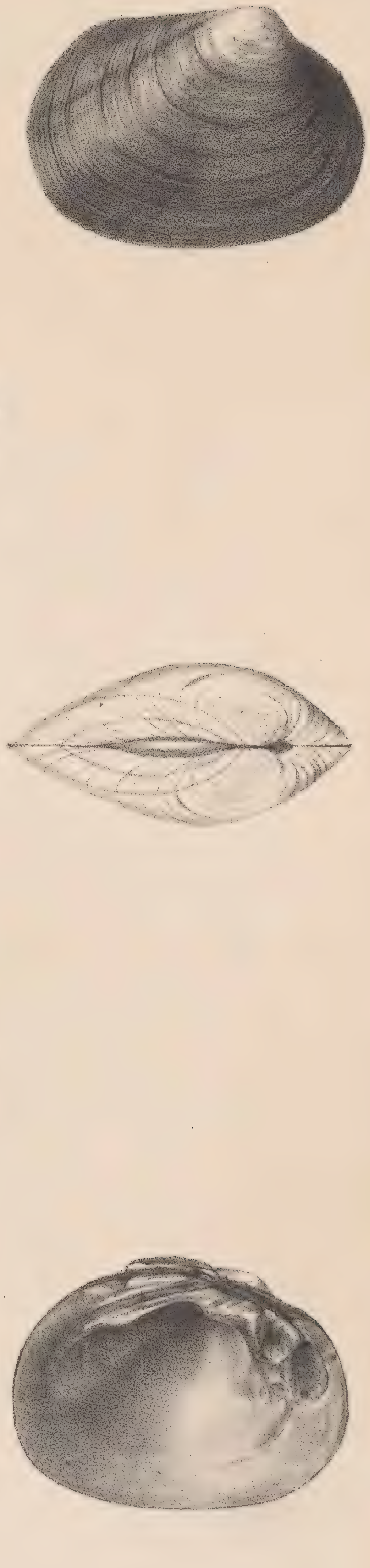
67



66

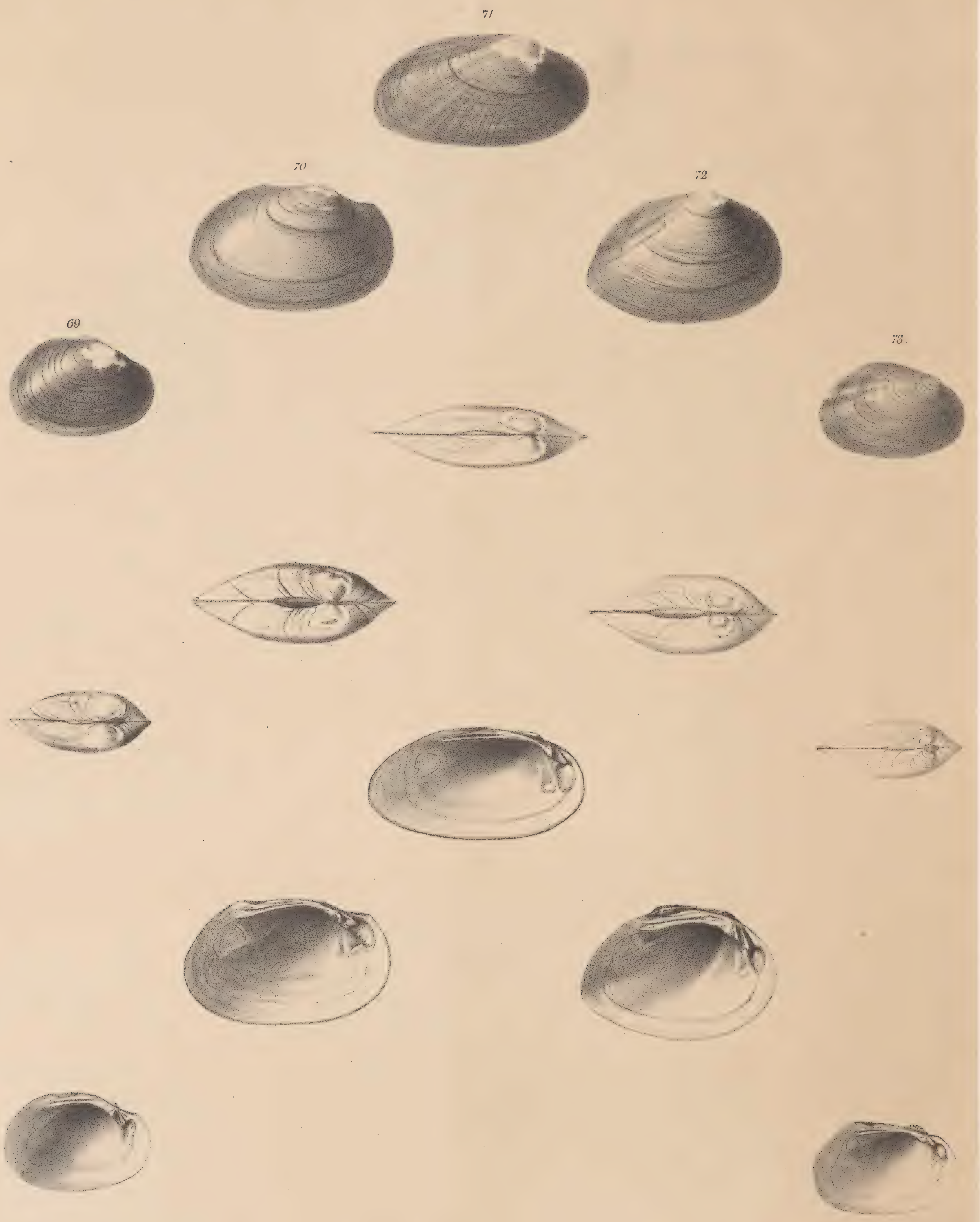


68



66. *Unio Mardinensis.*
67. *Monocondylæa Mardinensis.*
68. *Unio Emesaensis.*

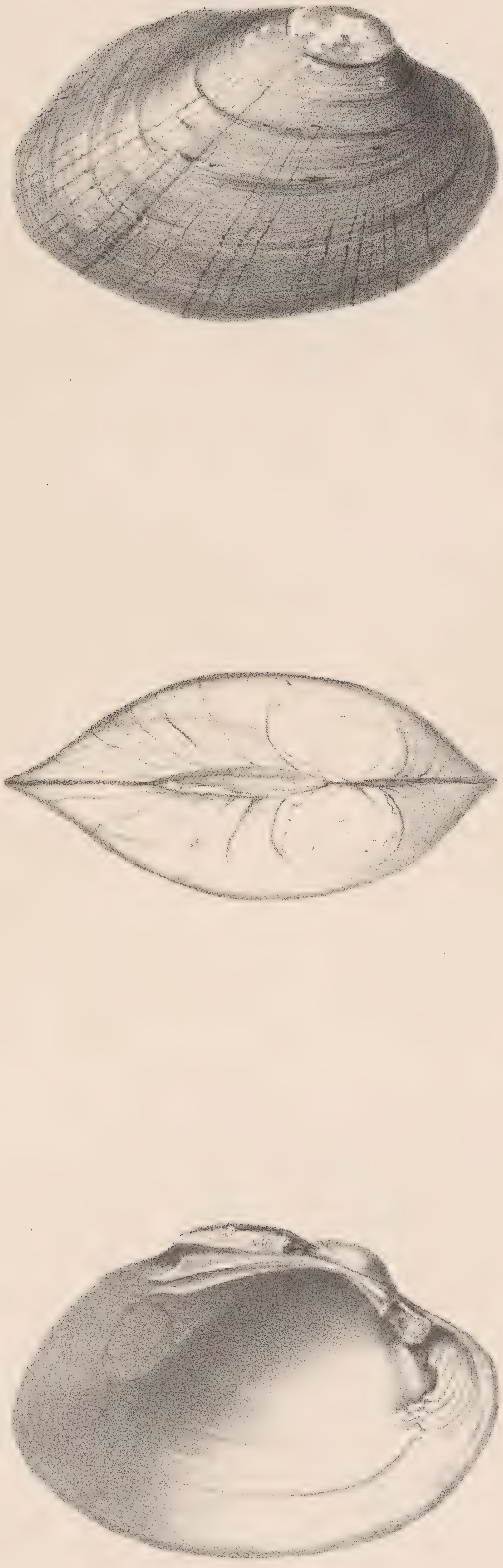
T. Sinclair's lith, Phil.



69 *Unio marginis.*
70 *Unio proprius.*
71 *Unio protensus.*
72 *Unio amabilis.*
73 *Unio Cromwellii.*

T. Sinclair's lith, Phila.

75



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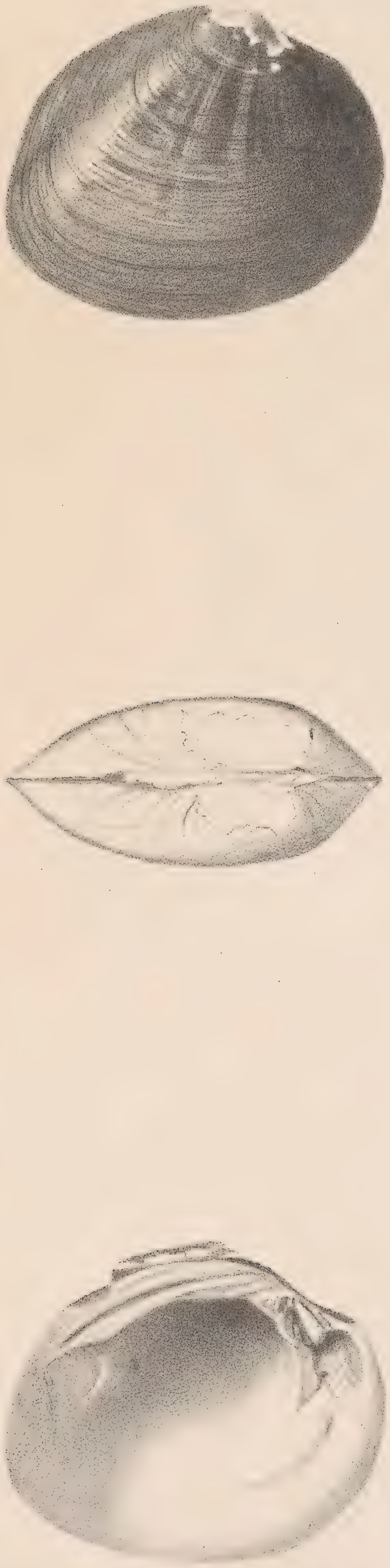
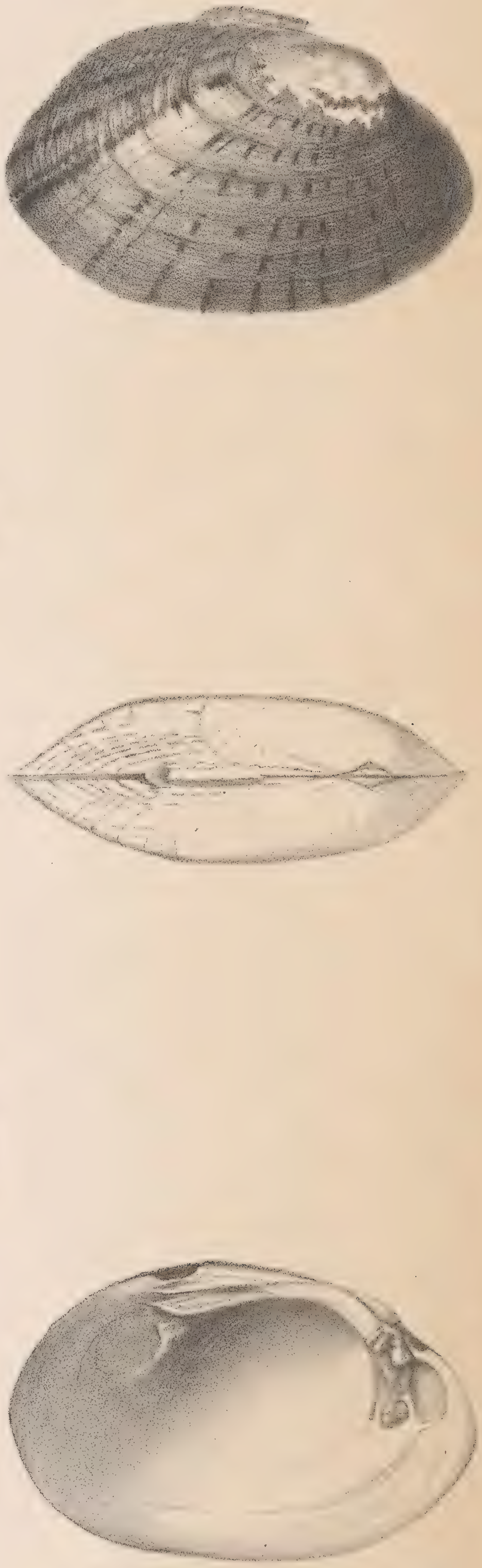


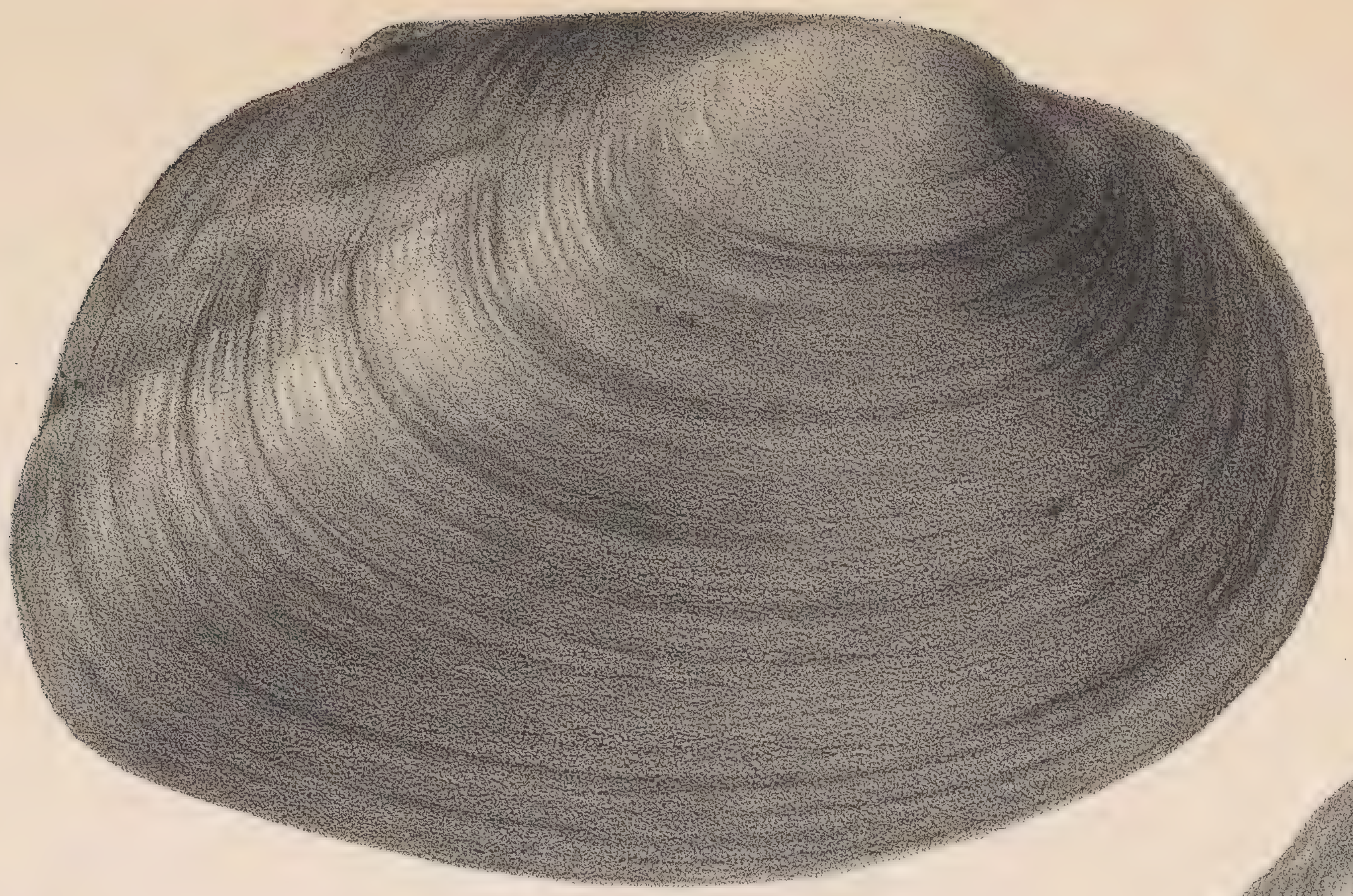
76



74 *Unio Lyonii.*
75 *Unio doliaris.*
76 *Unio punctatus.*

T. Sinclair's lith, Phil.

78



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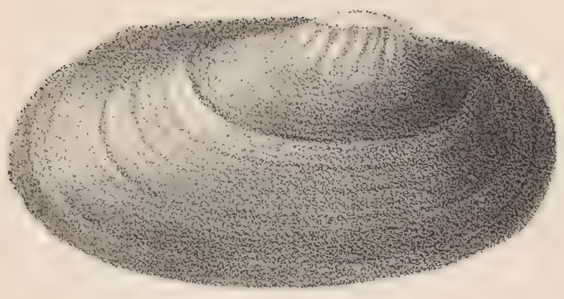

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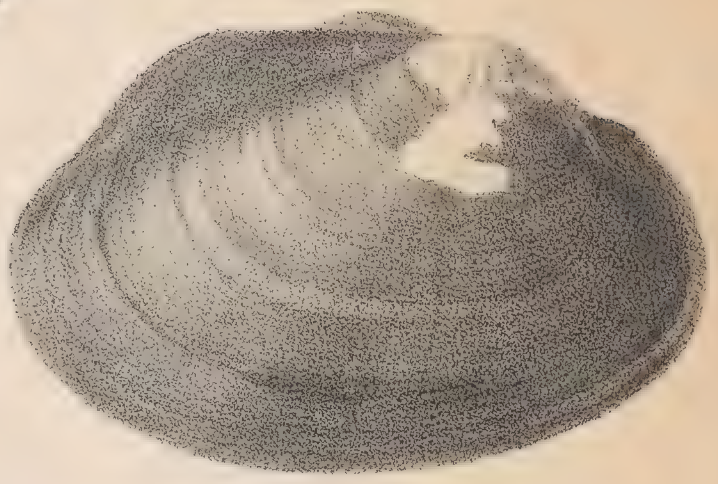
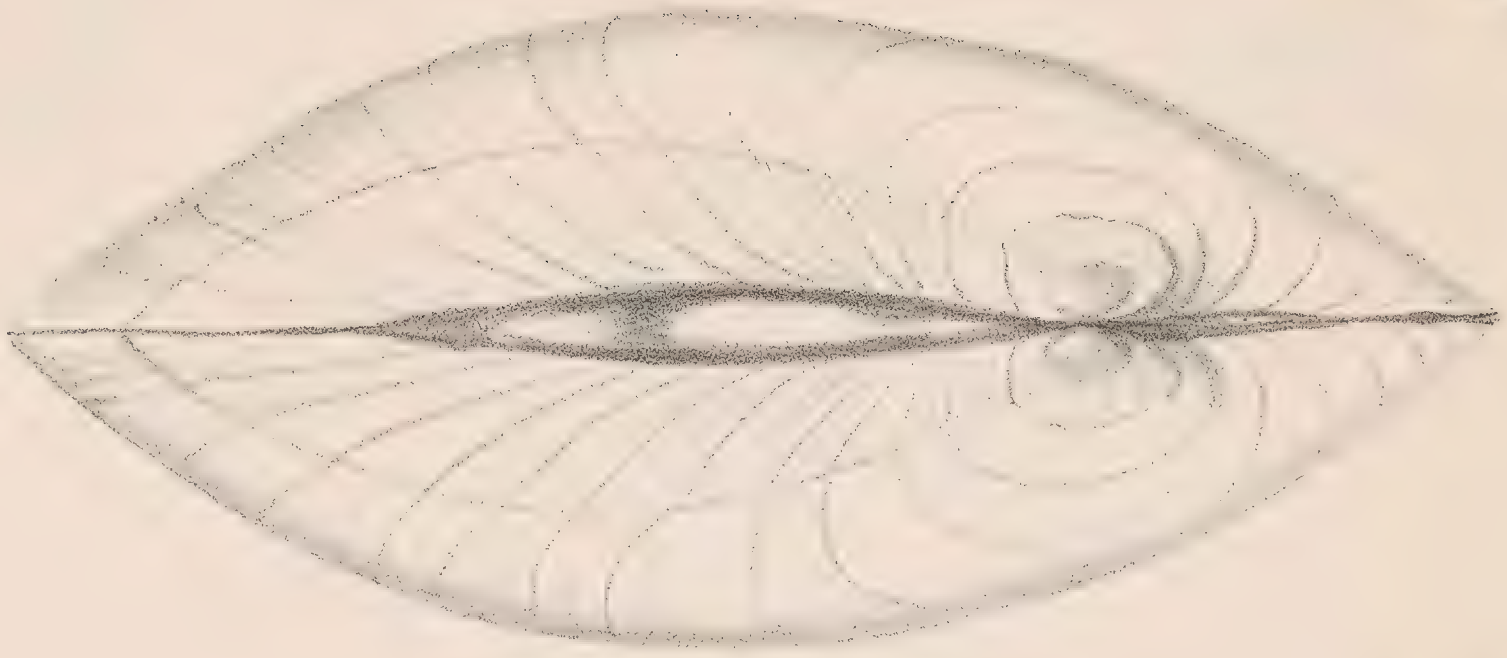
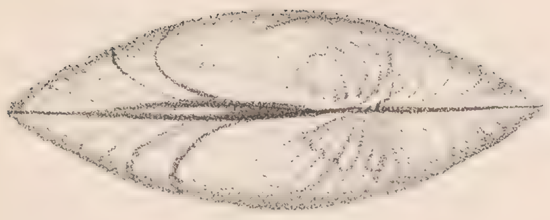
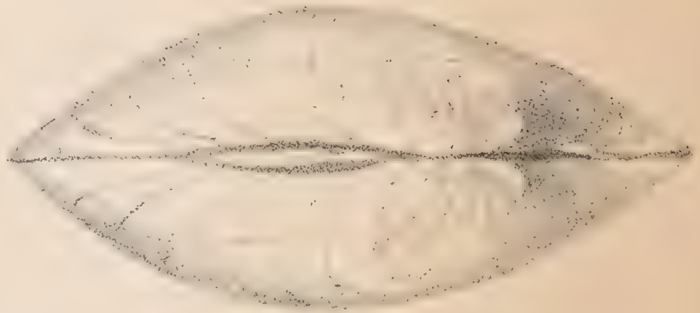
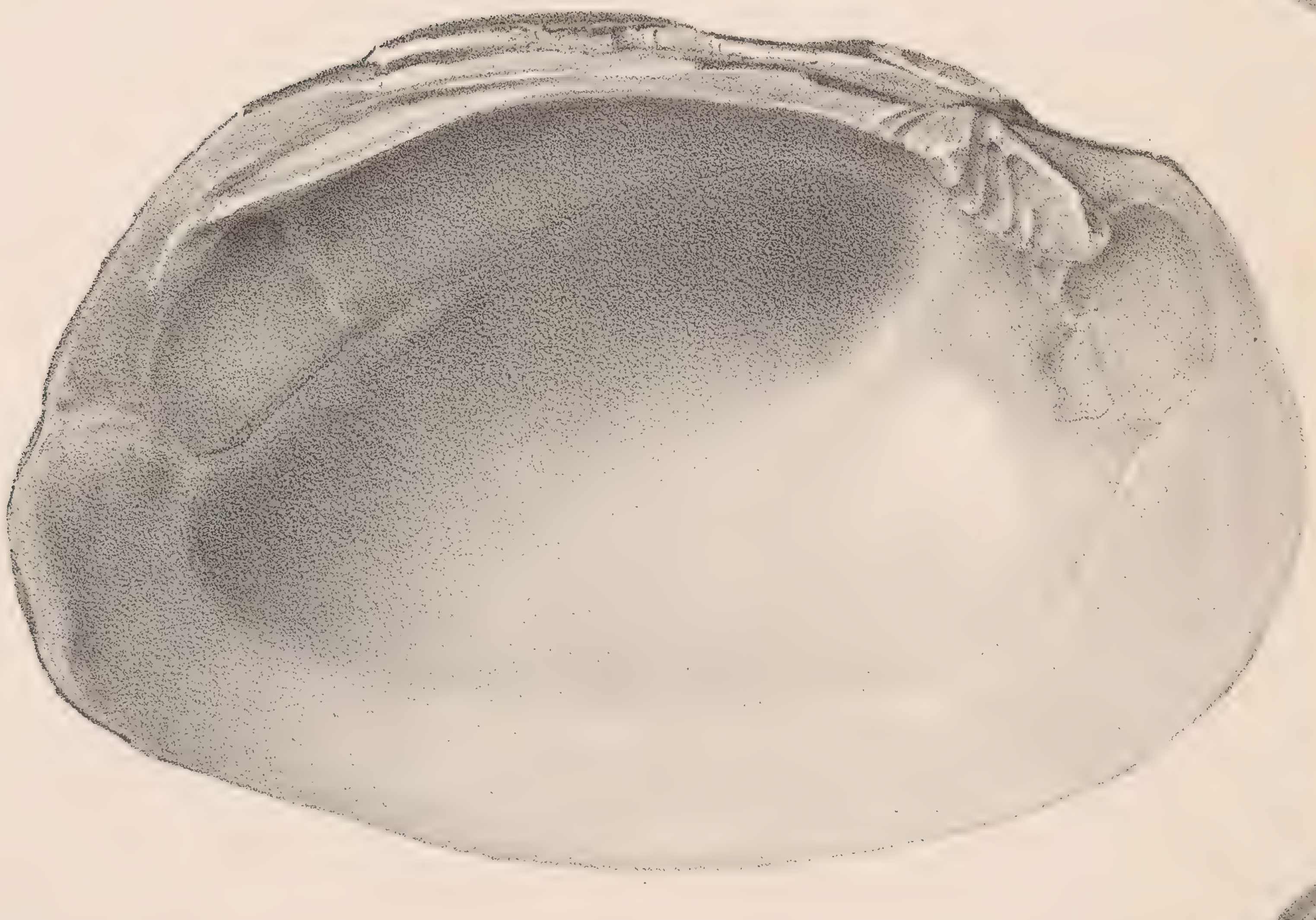
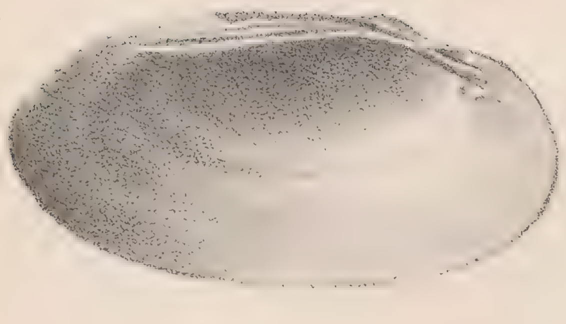


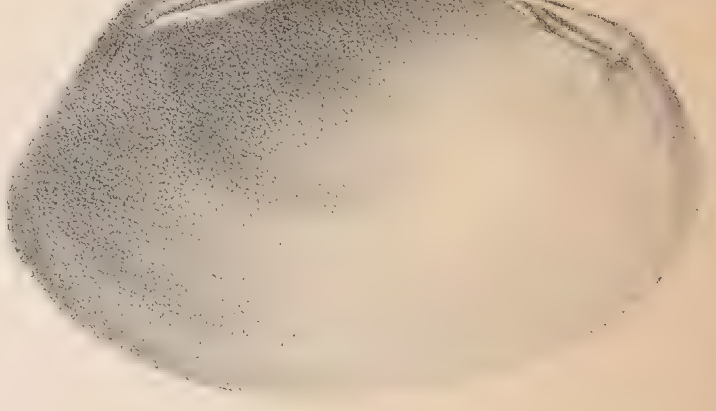






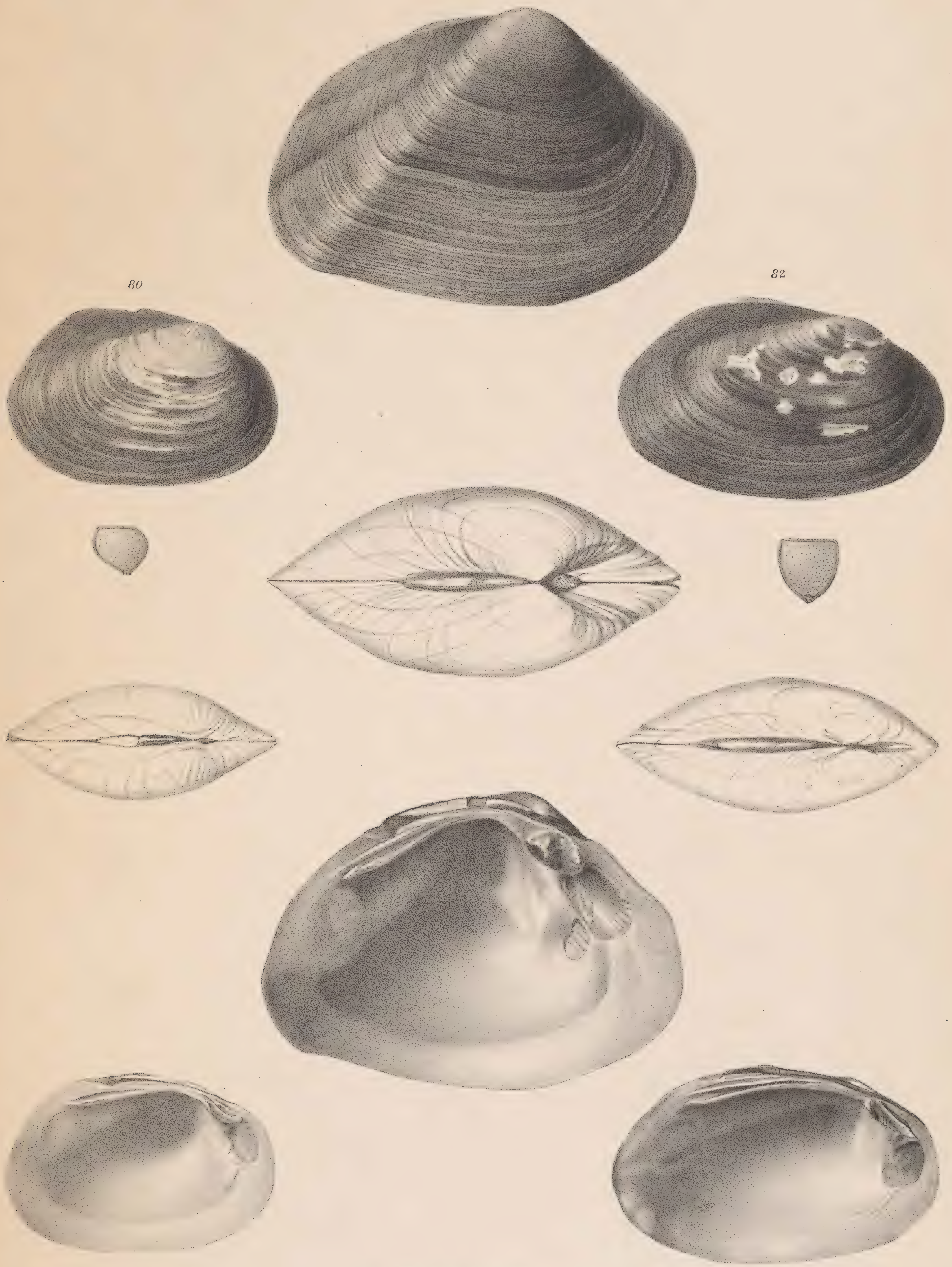






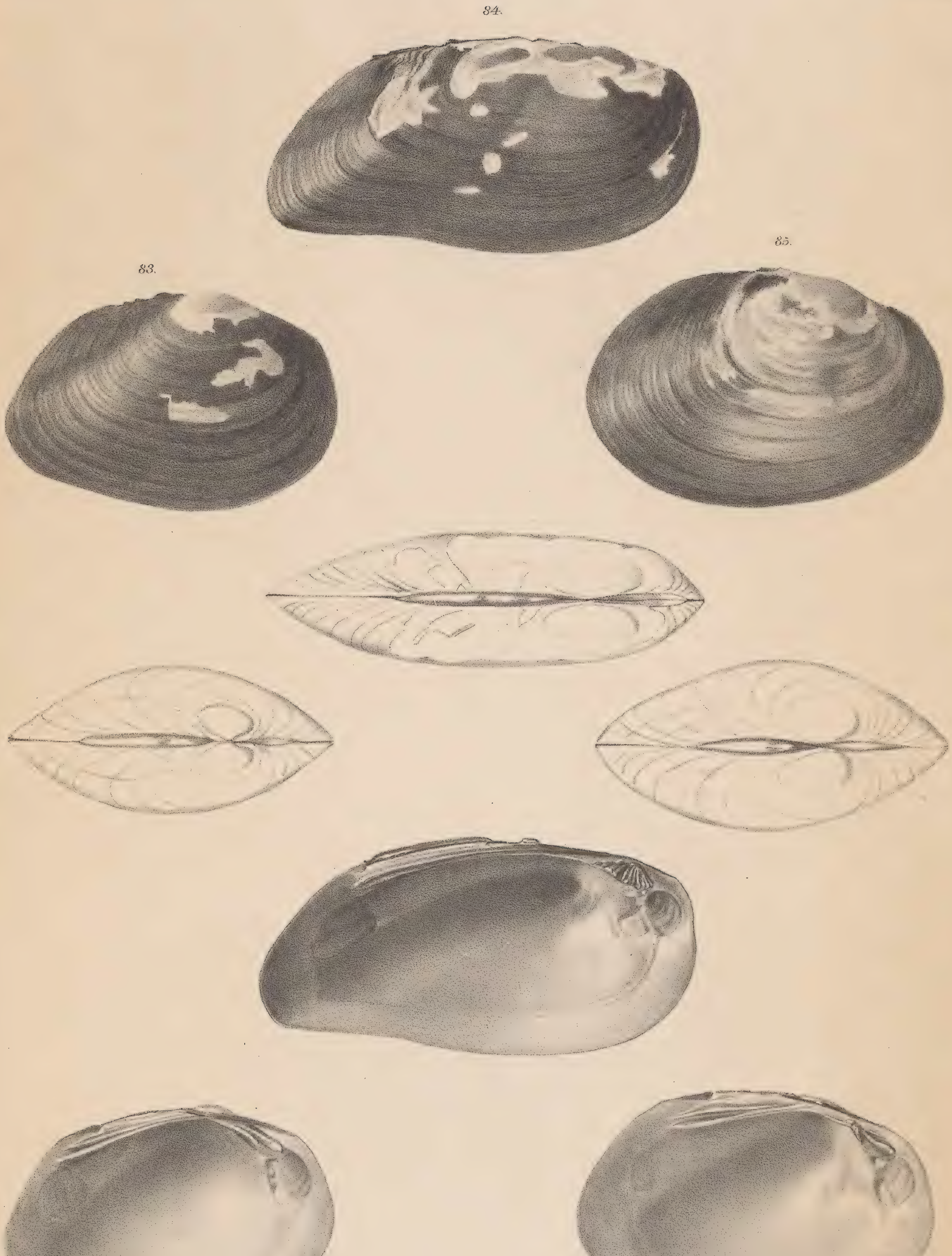
77 *Unio parvus*
78 *Unio apprimus*
79 *Unio locellus*

T. Sinclair's lith. Phil.



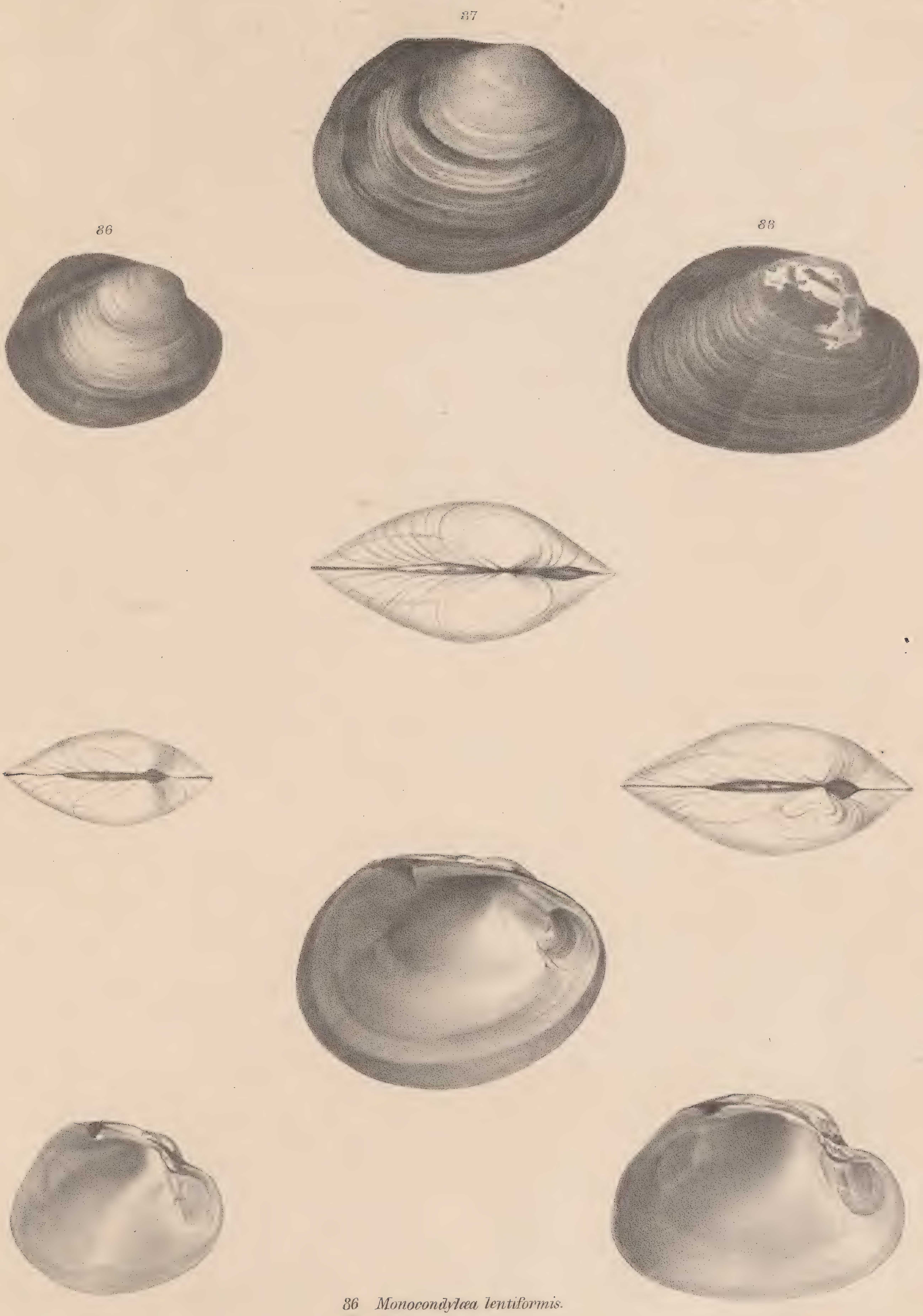
80 *Unio peculiaris*
81 *Unio rugososulcatus*
82 *Unio firmus.*

T. Sinclair's lith Phil.



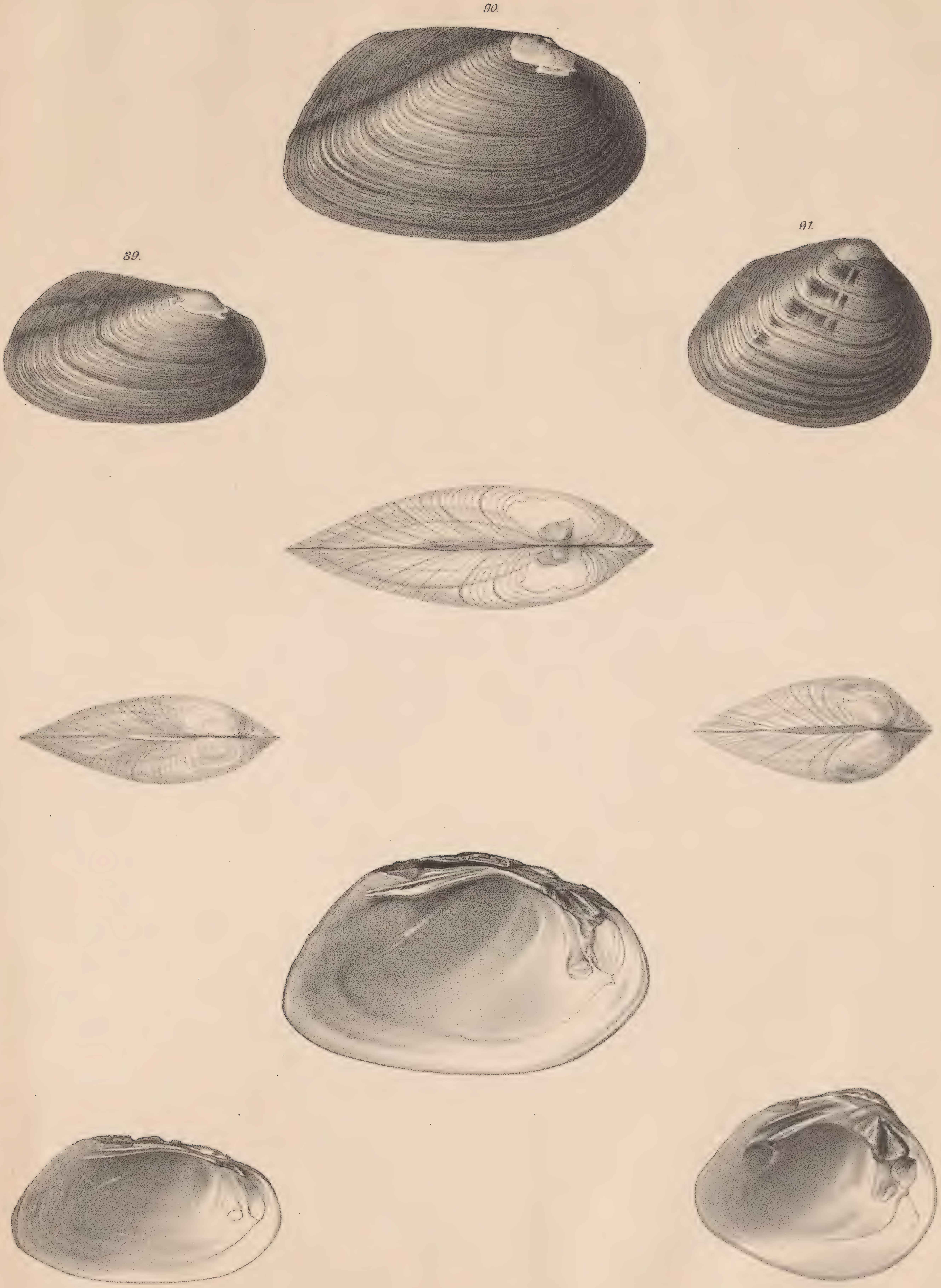
83. *Unio ampullacens*
84. *Unio acutirostris*
85. *Unio Paraguayensis*

T. Sinclair's lith. Phil.



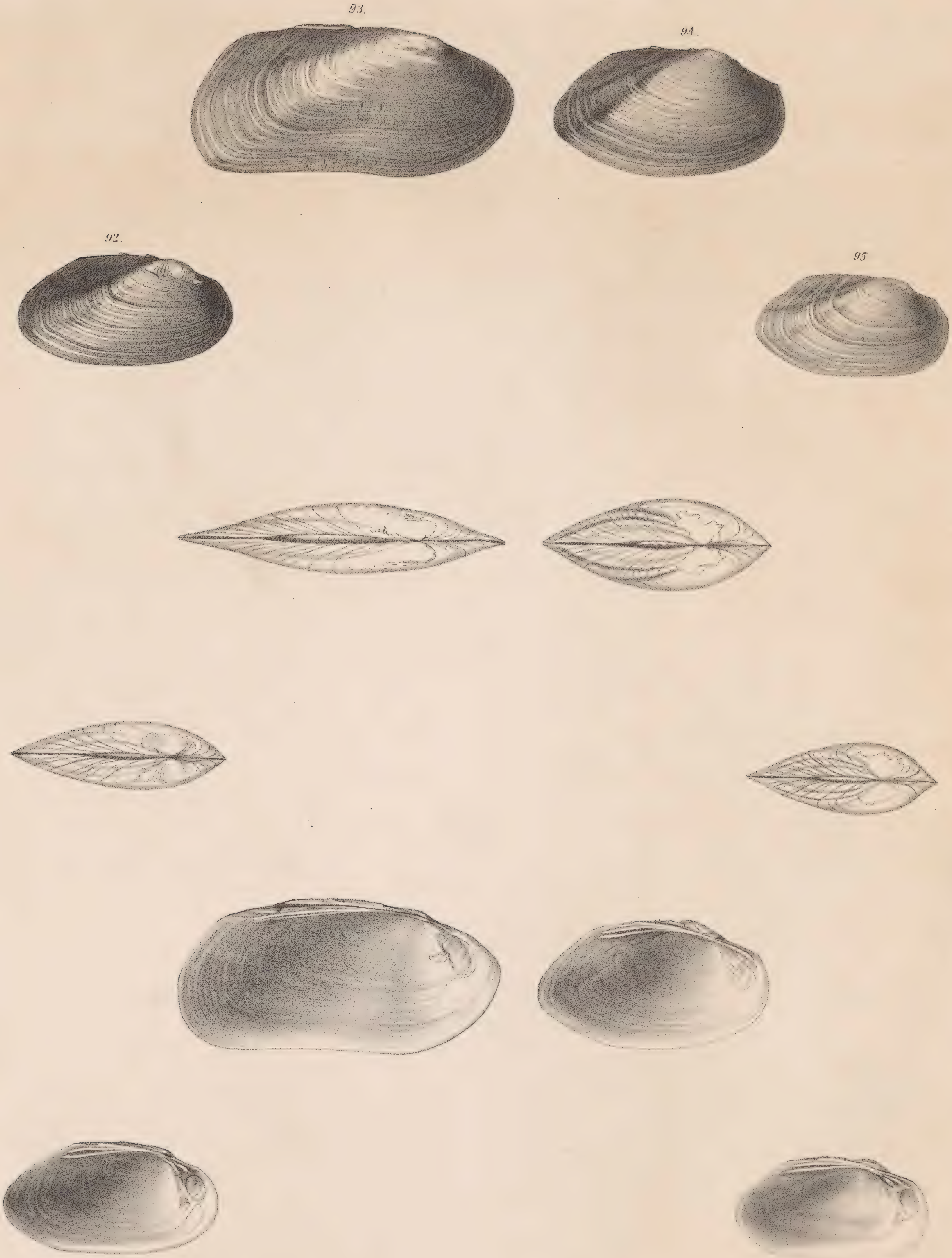
86 *Monocondylæa lentiformis.*
87 *Anodonta Pazii.*
88 *Monocondylæa Pazii.*

T. Sinclair's Lith. Phil.



T. Sinclair lith., Philada.

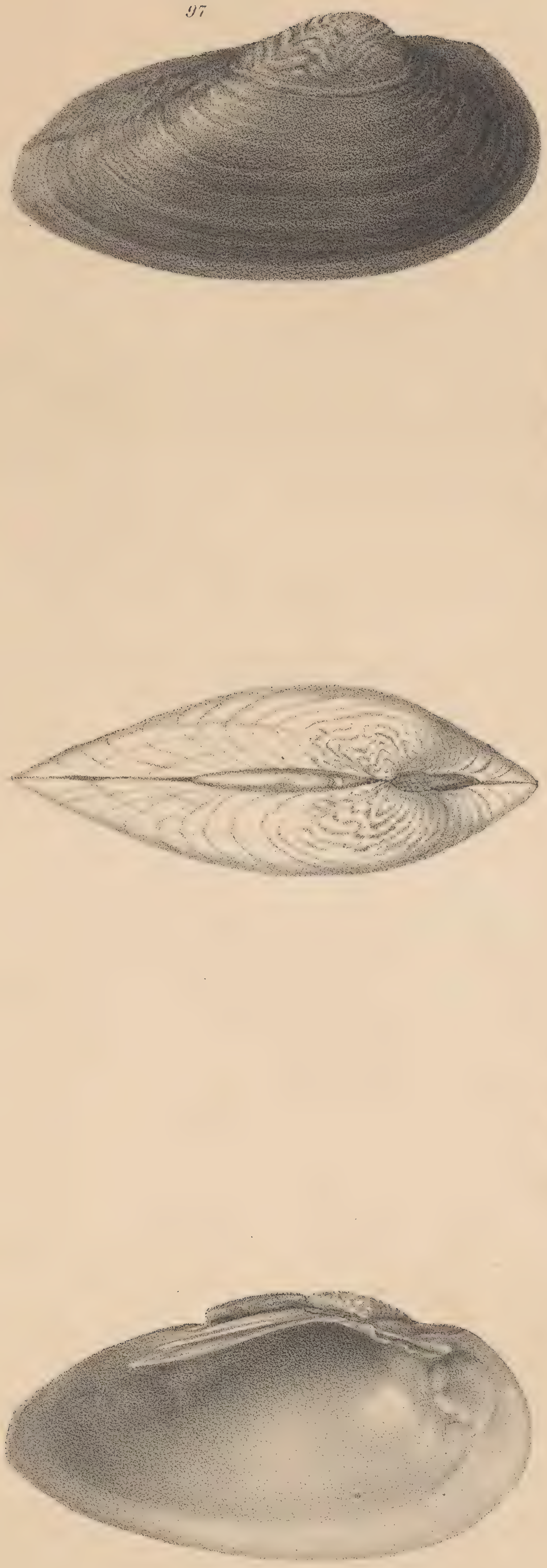
89. *Unio Jewettii.*
90. *Unio Bisselianus.*
91. *Unio Clinchensis.*



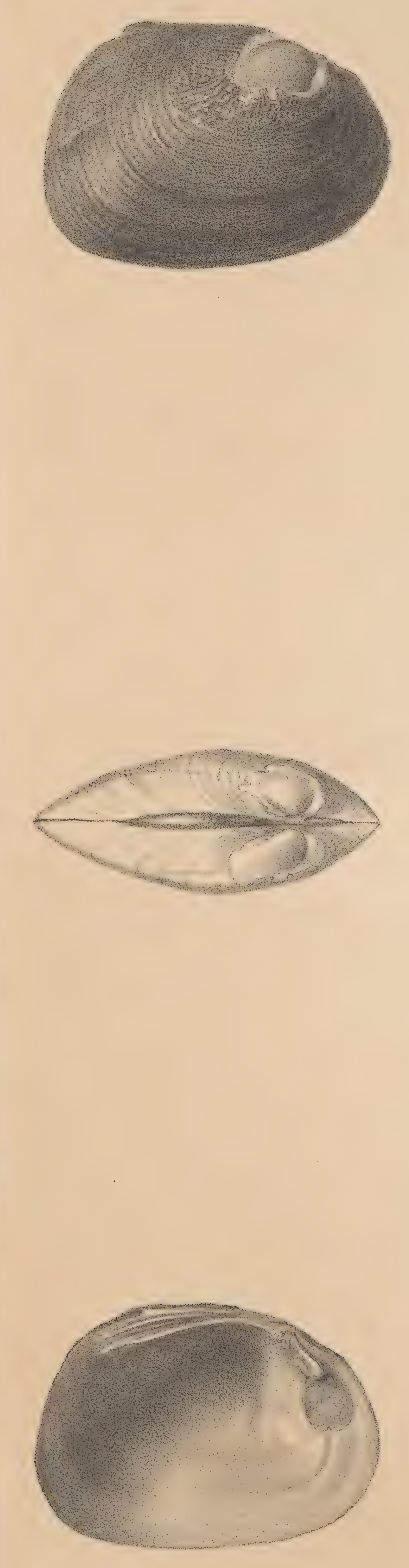
T Sinclair's lith. Phila

92. *Unio evitatus.* 94. *Unio asperulus.*
93. *Unio Siamensis.* 95. *Unio pilatus.*

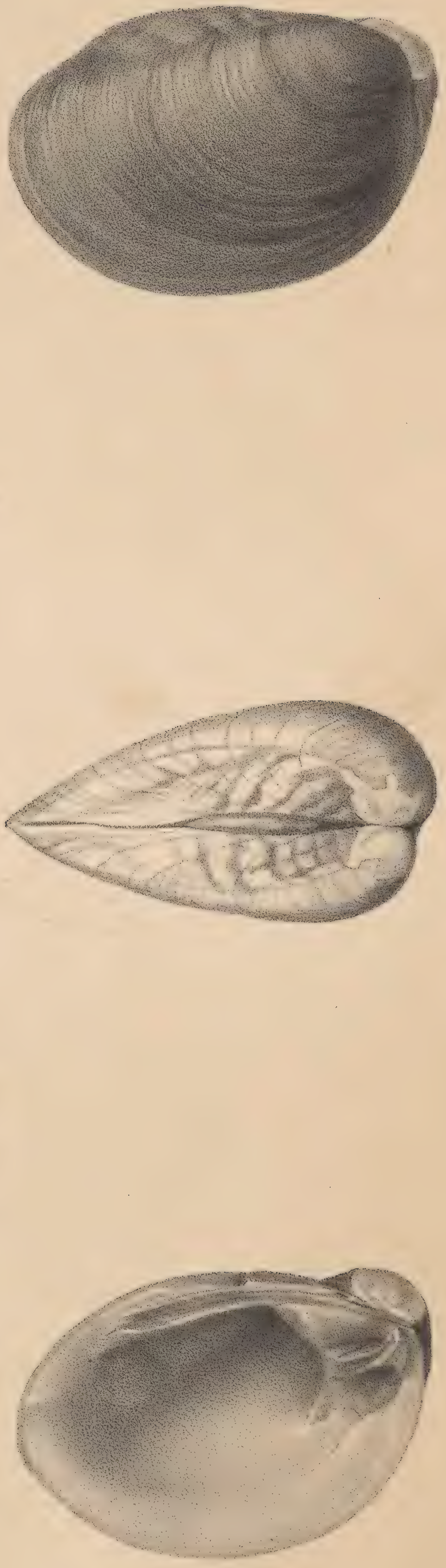
97



96



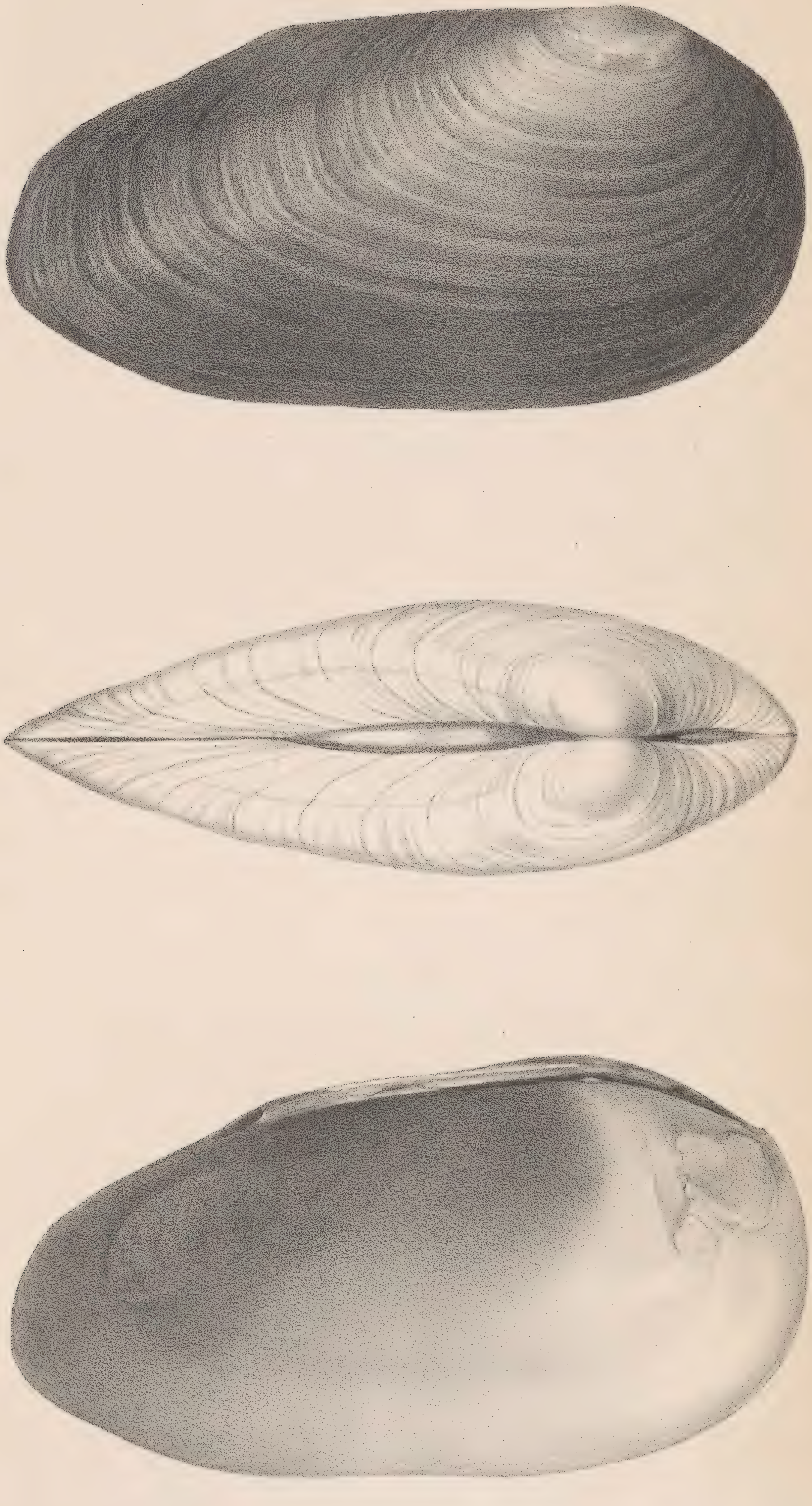
98



96. *Unio rufofuscus.*
97. *Unio Wrightii.*
98. *Unio tortuosus.*

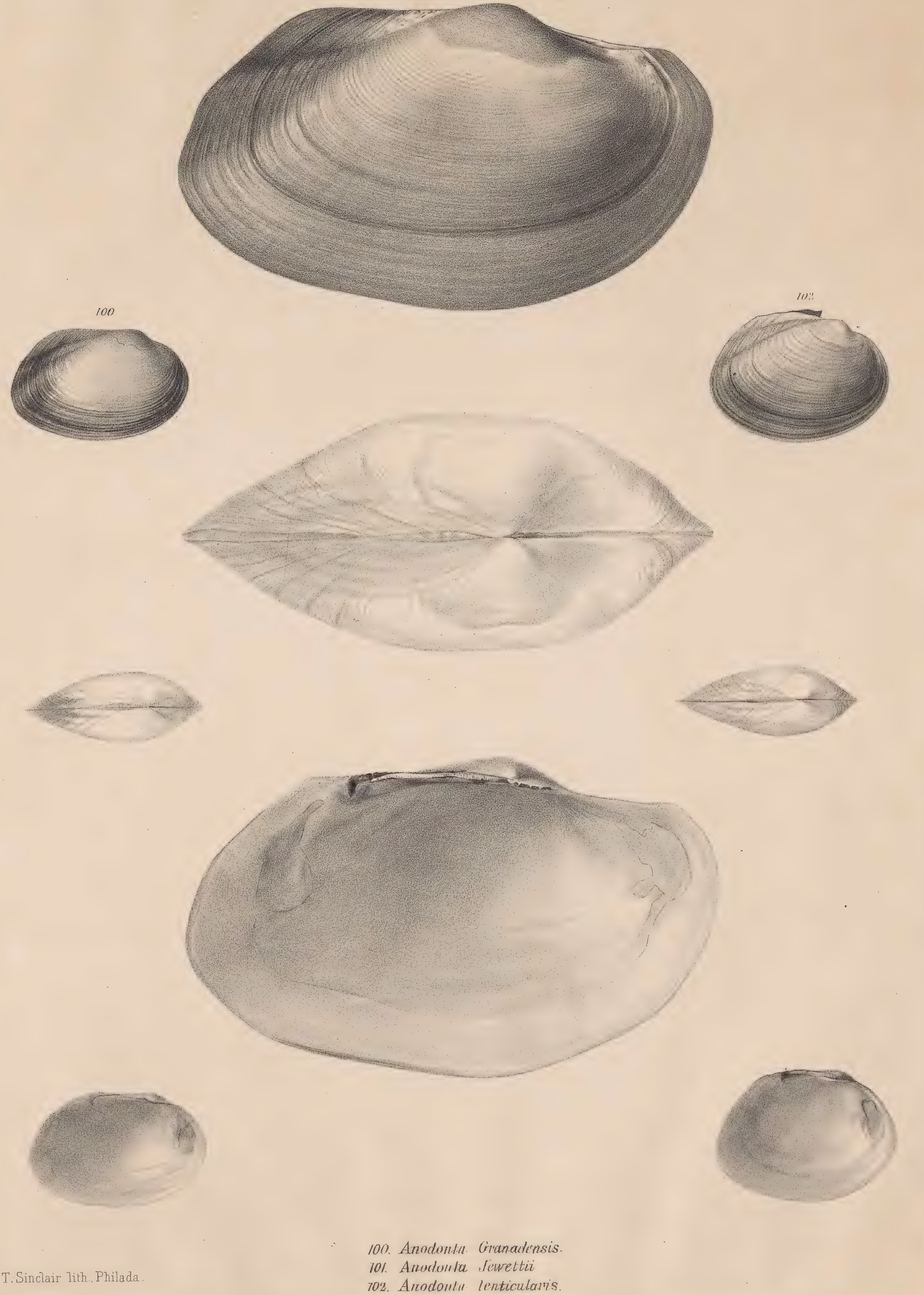
T. Sinclair lith. Philada

99



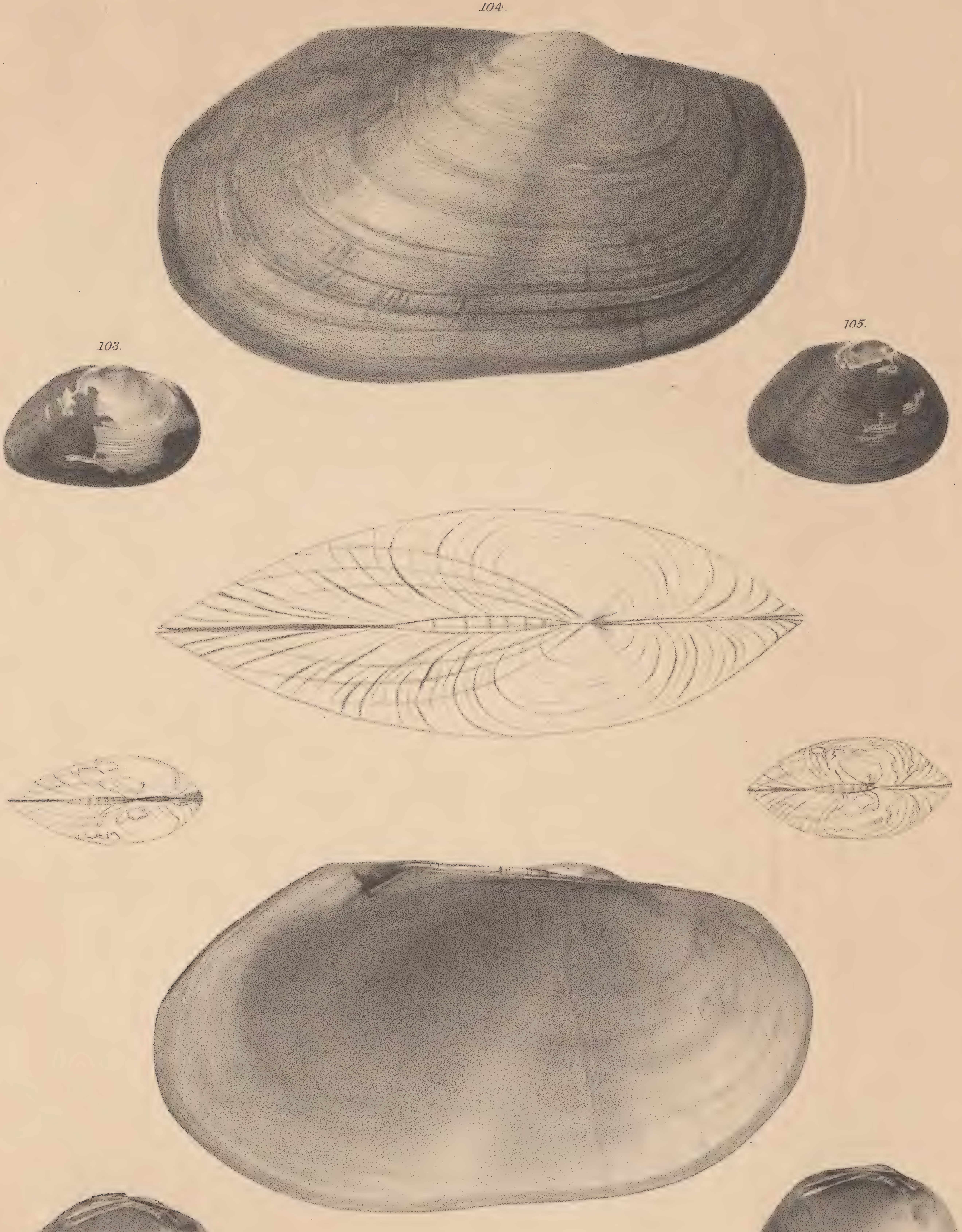
99 *Anodonta Youkanensis.*

T. Sinclair lith. Philada.



T. Sinclair lith., Philada.

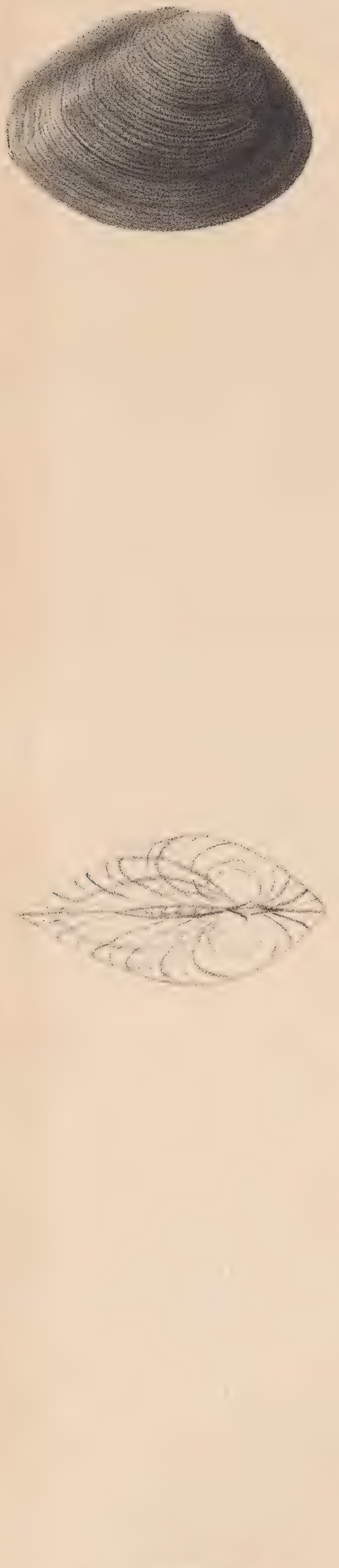
100. *Anodonta Granadensis.*
101. *Anodonta Jewettii*
102. *Anodonta lenticularis.*



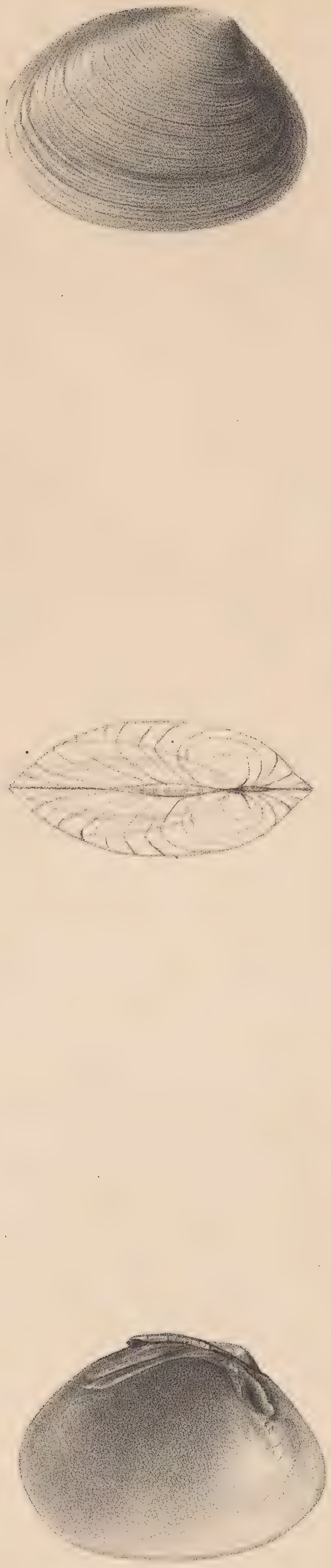
T. Sinclair lith., Philada.

103 *Unio Granadensis.*
104 *Anodonta Bridgesii.*
105 *Unio encarpus.*

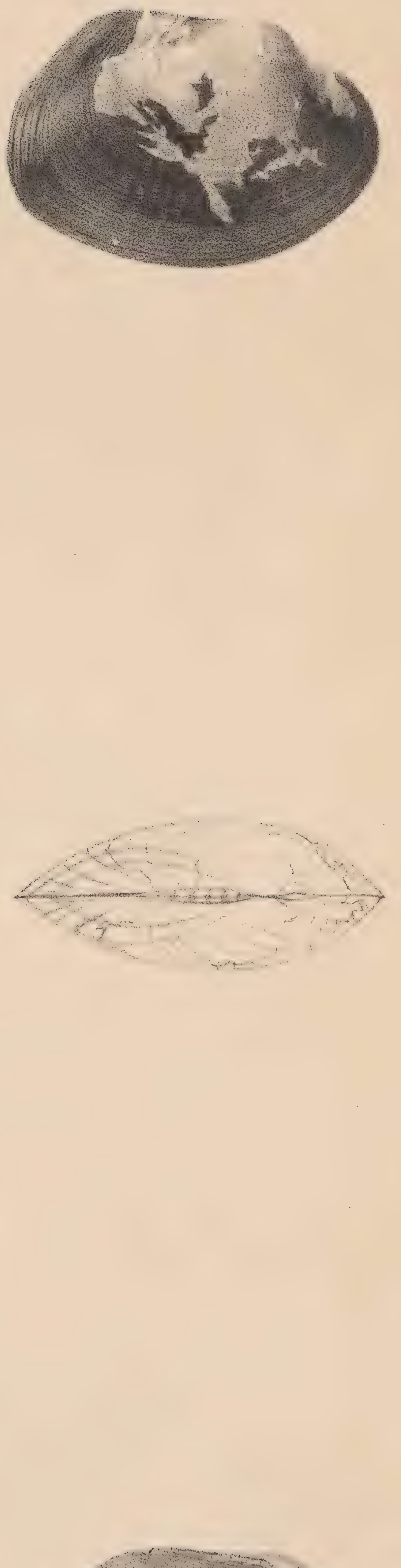
106



107

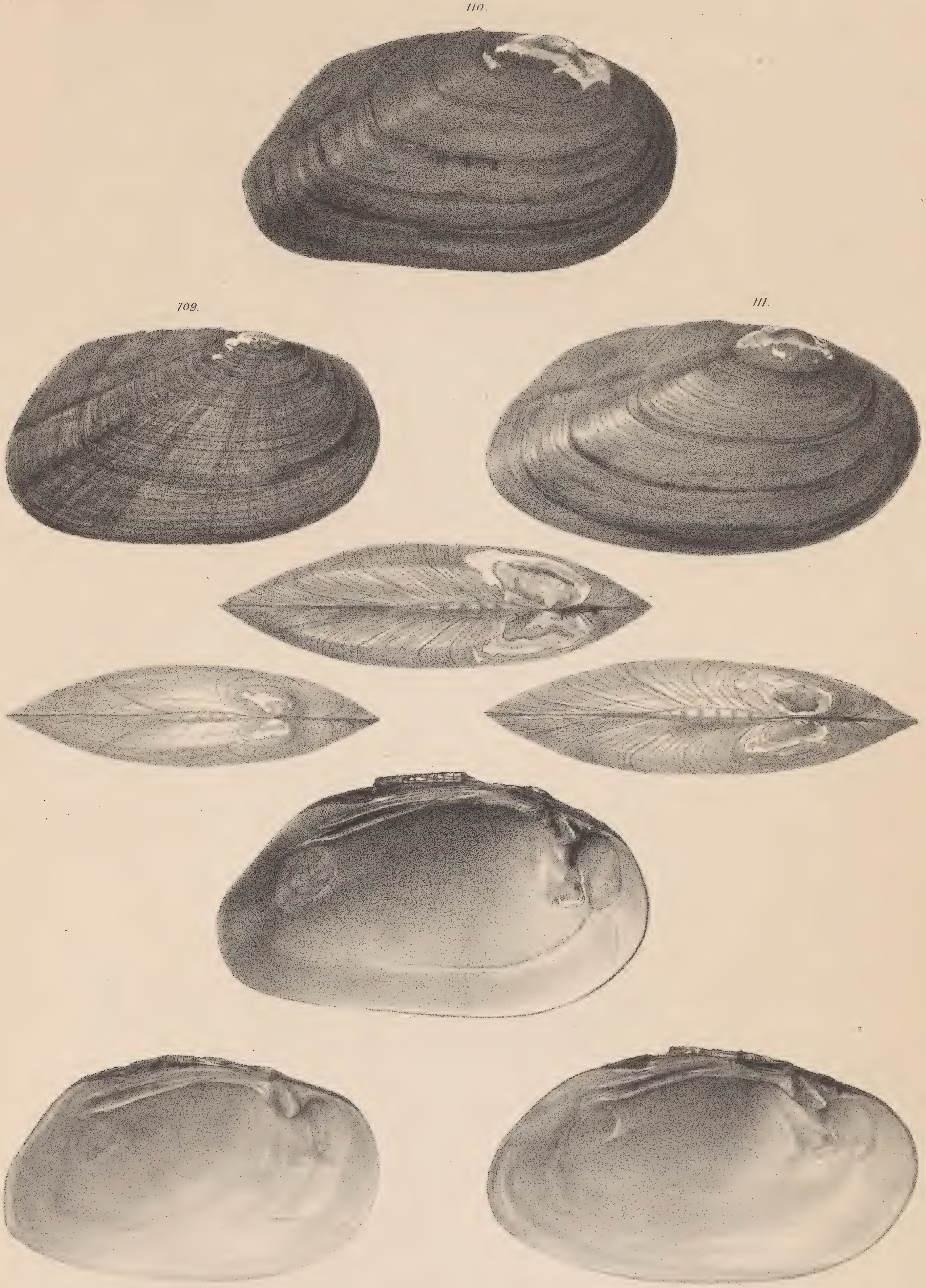


108



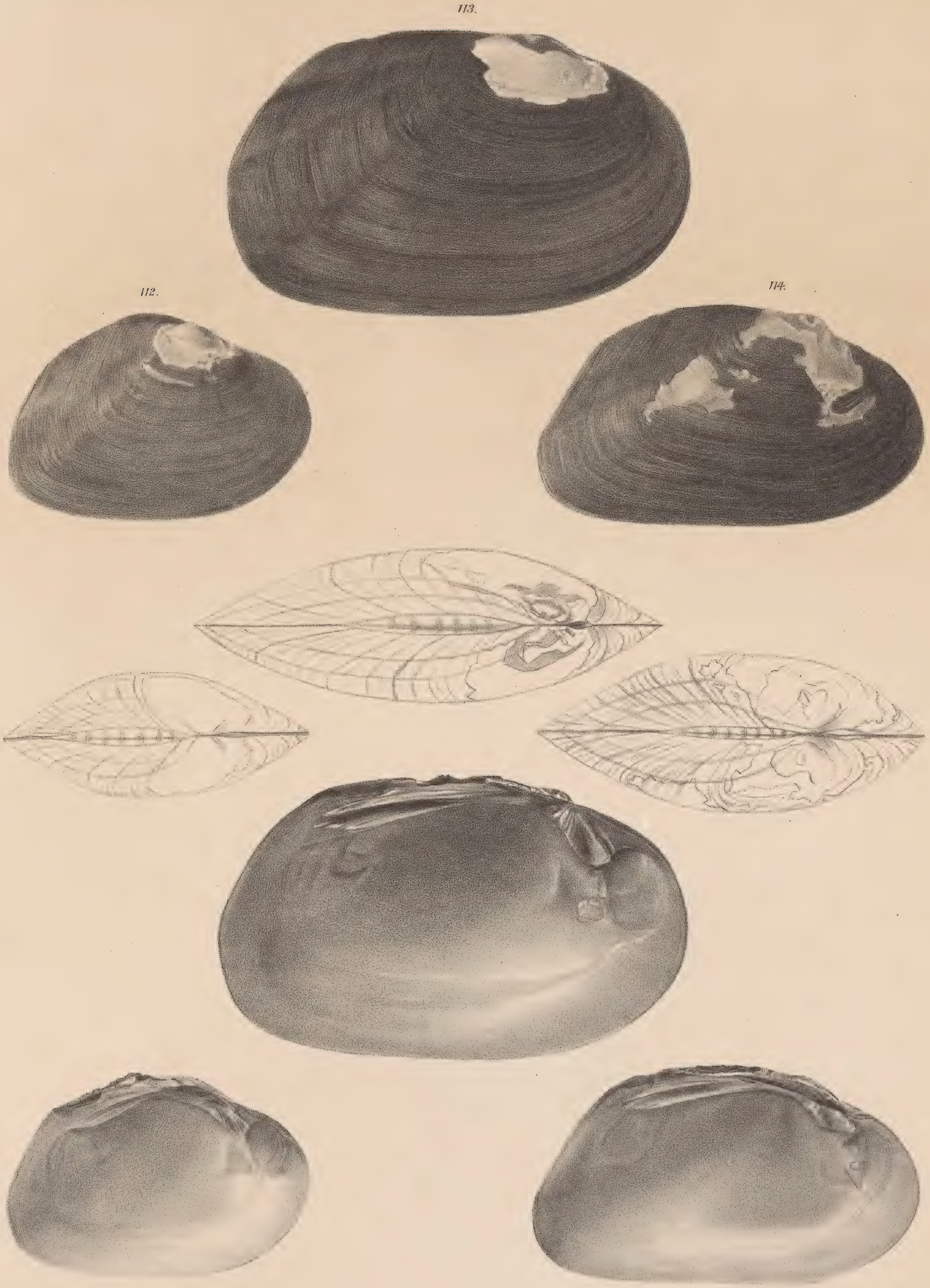
T. Sinclair lith. Philada.

106. *Unio Gabbianus.*
107. *Unio Nicaraguensis.*
108. *Anodonta inæquivalva.*



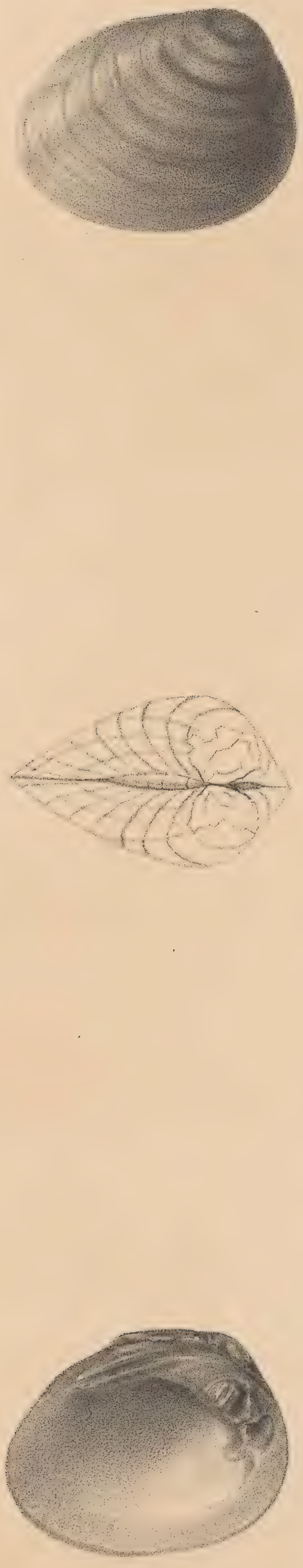
T. Sinclair lith. Philada.

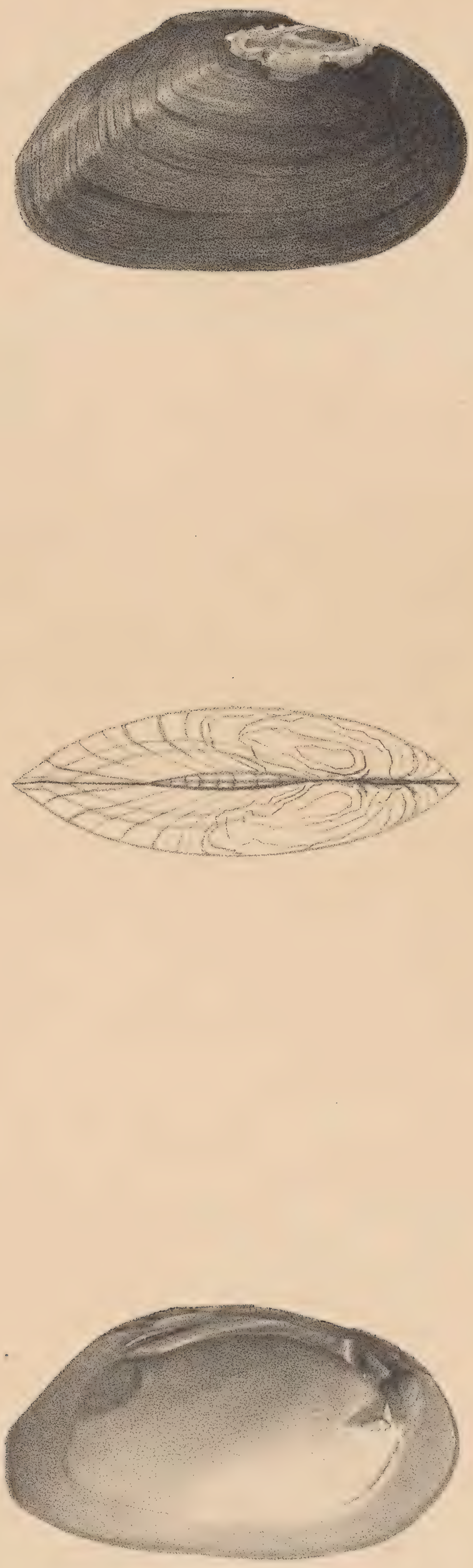
109. *Unio Beaverensis.*
110. *Unio nubilus.*
111. *Unio datus.*



112. *Unio dorsatus*
113. *Unio humerosus*
114. *Unio Pawensis*

T. Sinclair lith. Philada.

115


116


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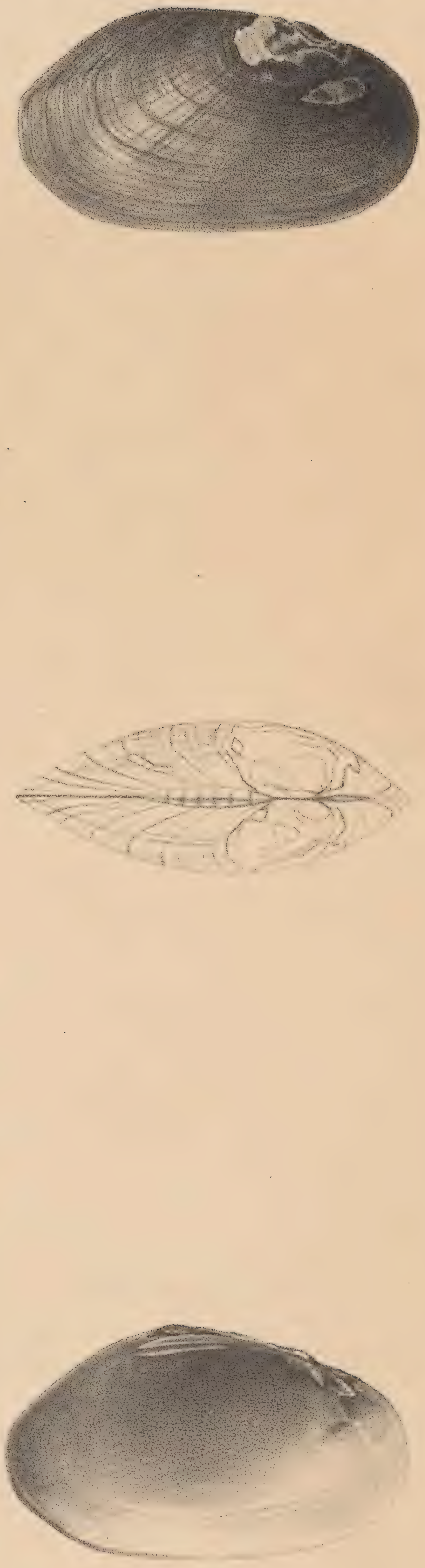
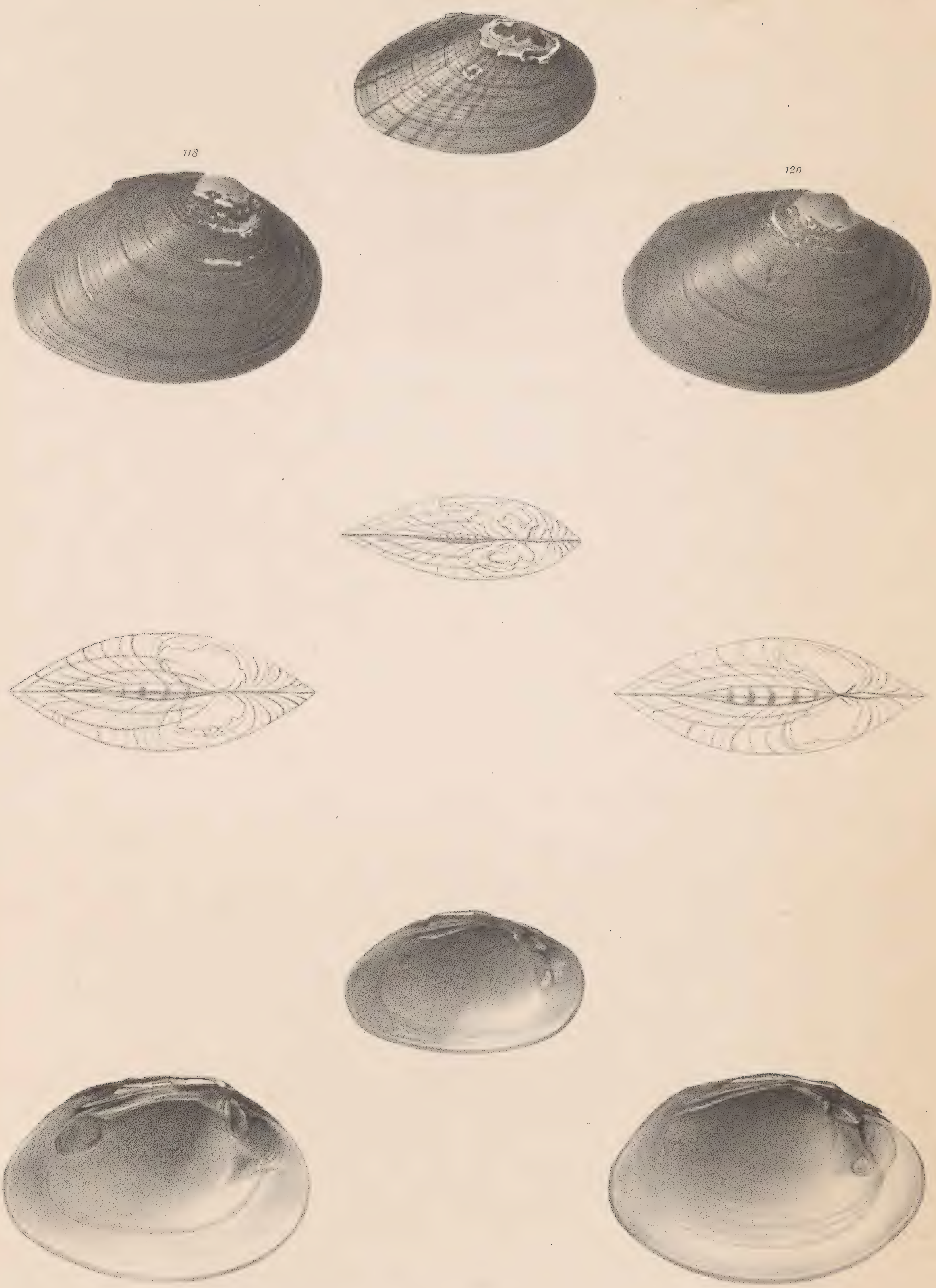


115. *Unio Murrayensis.*
116. *Unio Uharéensis.*
117. *Unio genuinus.*

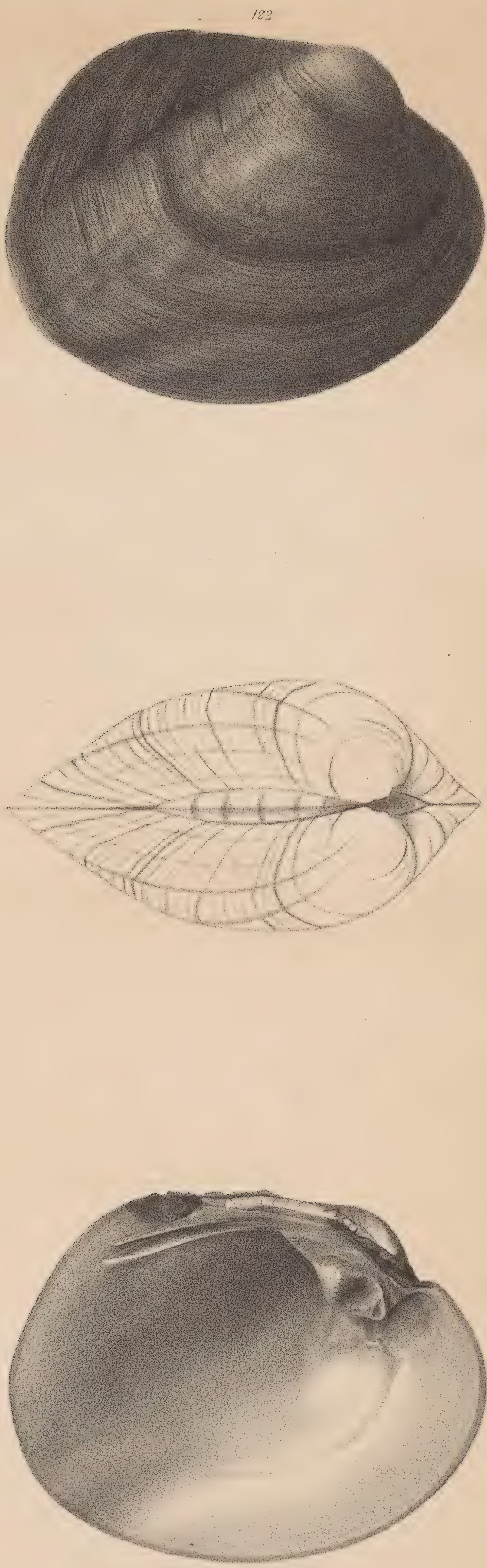
T. Sinclair lith., Philada.



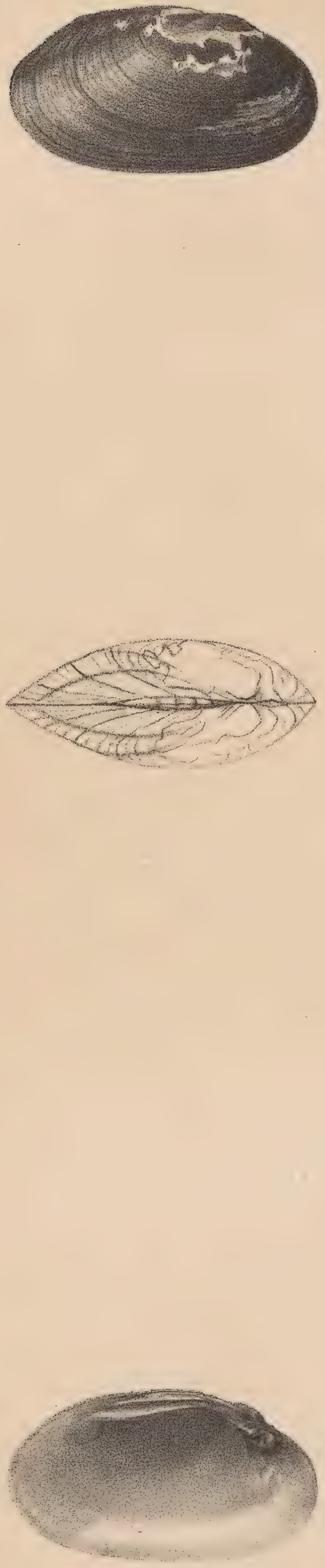
T. Sinclair lith. Philada.

118. *Unio fascinans.*
119. *Unio sparus.*
120. *Unio Copei.*

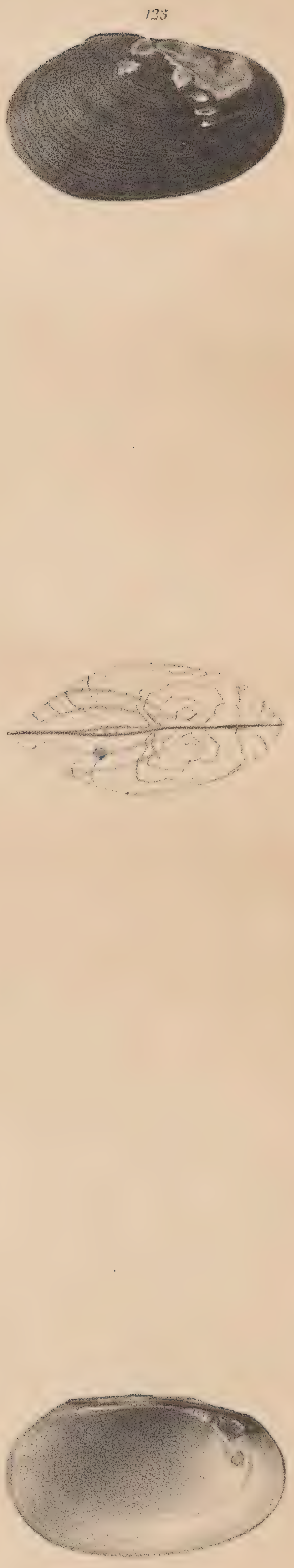
122



121.



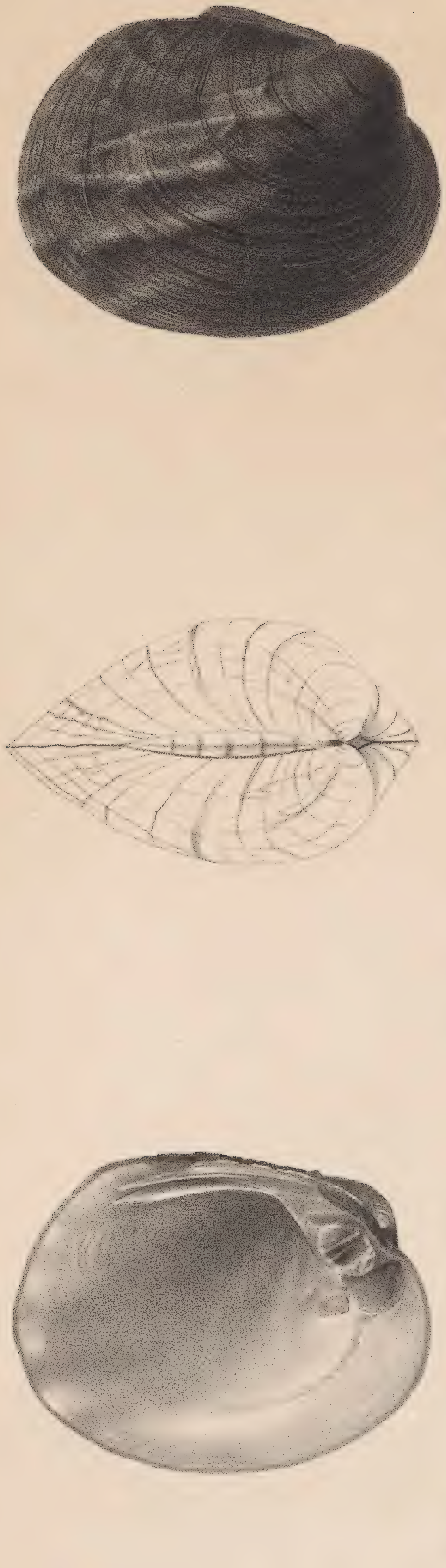
123



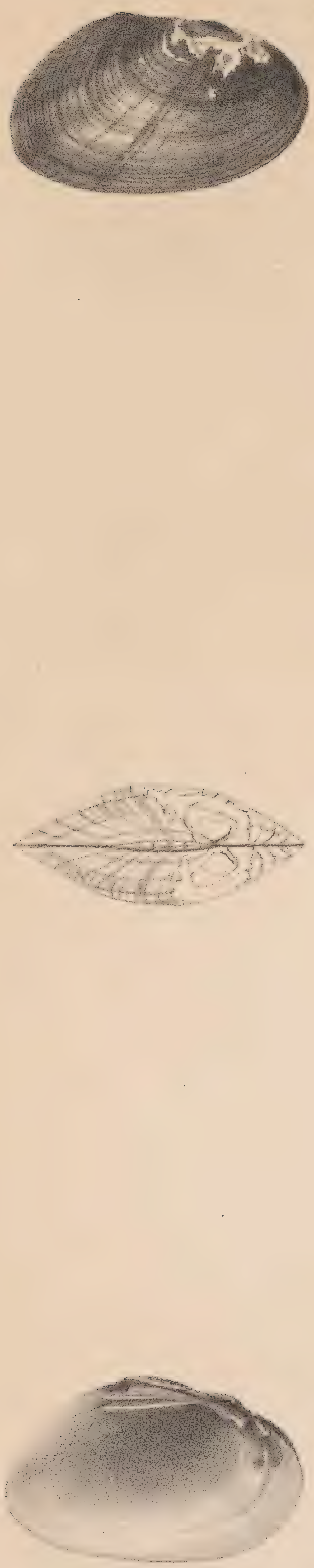
121. *Unio cylindrellus.*
122. *Unio Brazosensis.*
123. *Unio corvinus.*

T. Sinclair's lith. Phil.

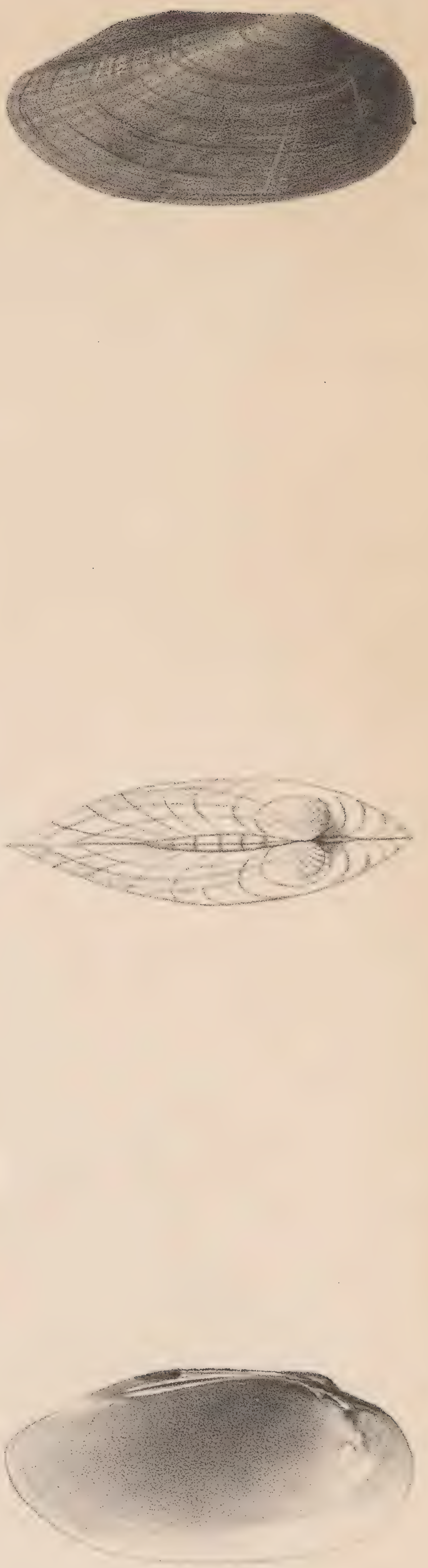
125



124



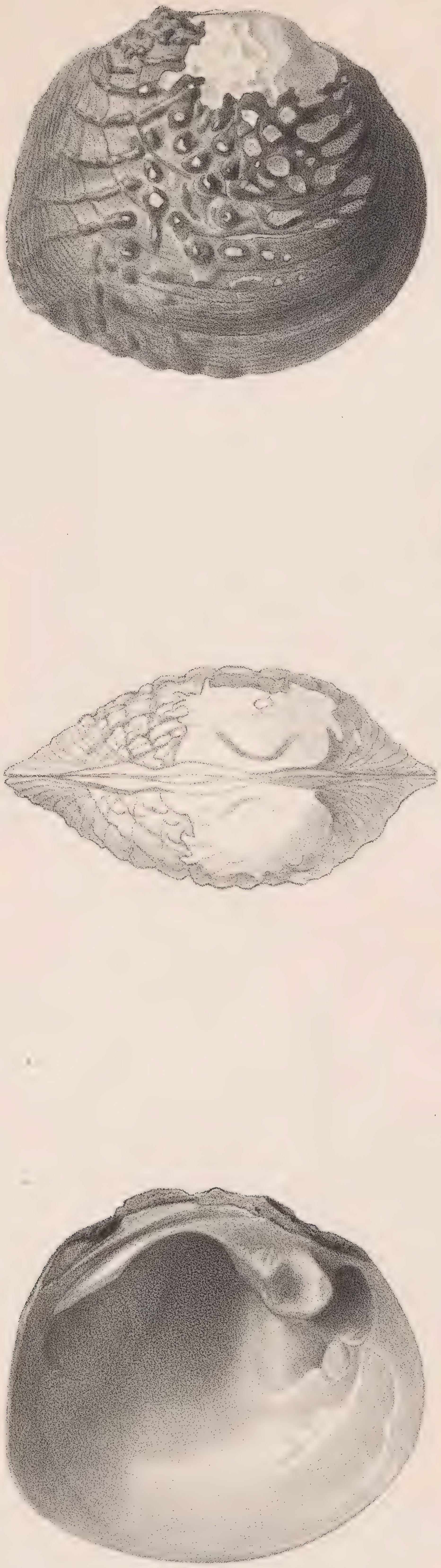
126



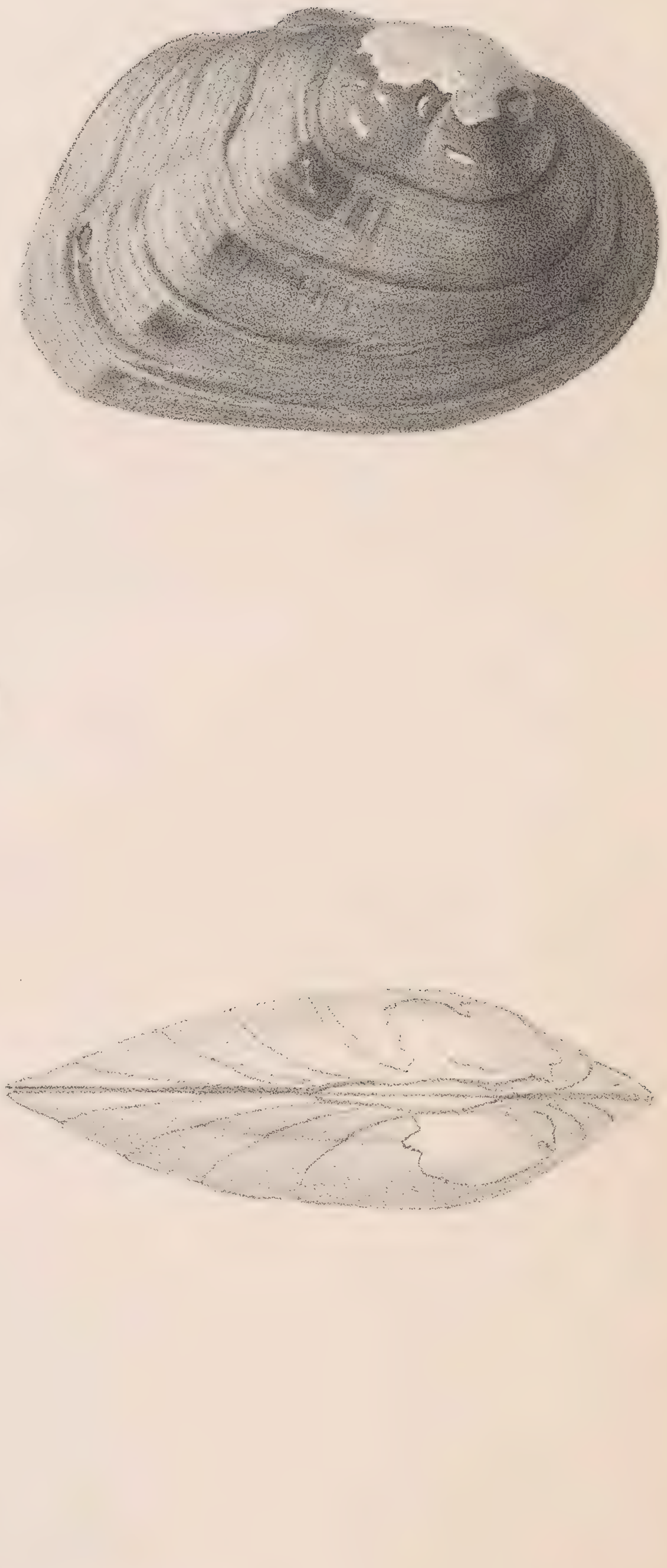
124. *Unio difficilis.*
125. *Unio Lincicumii.*
126. *Unio Topekaensis.*

T. Sinclairs lith. Phil^{a}.

128.



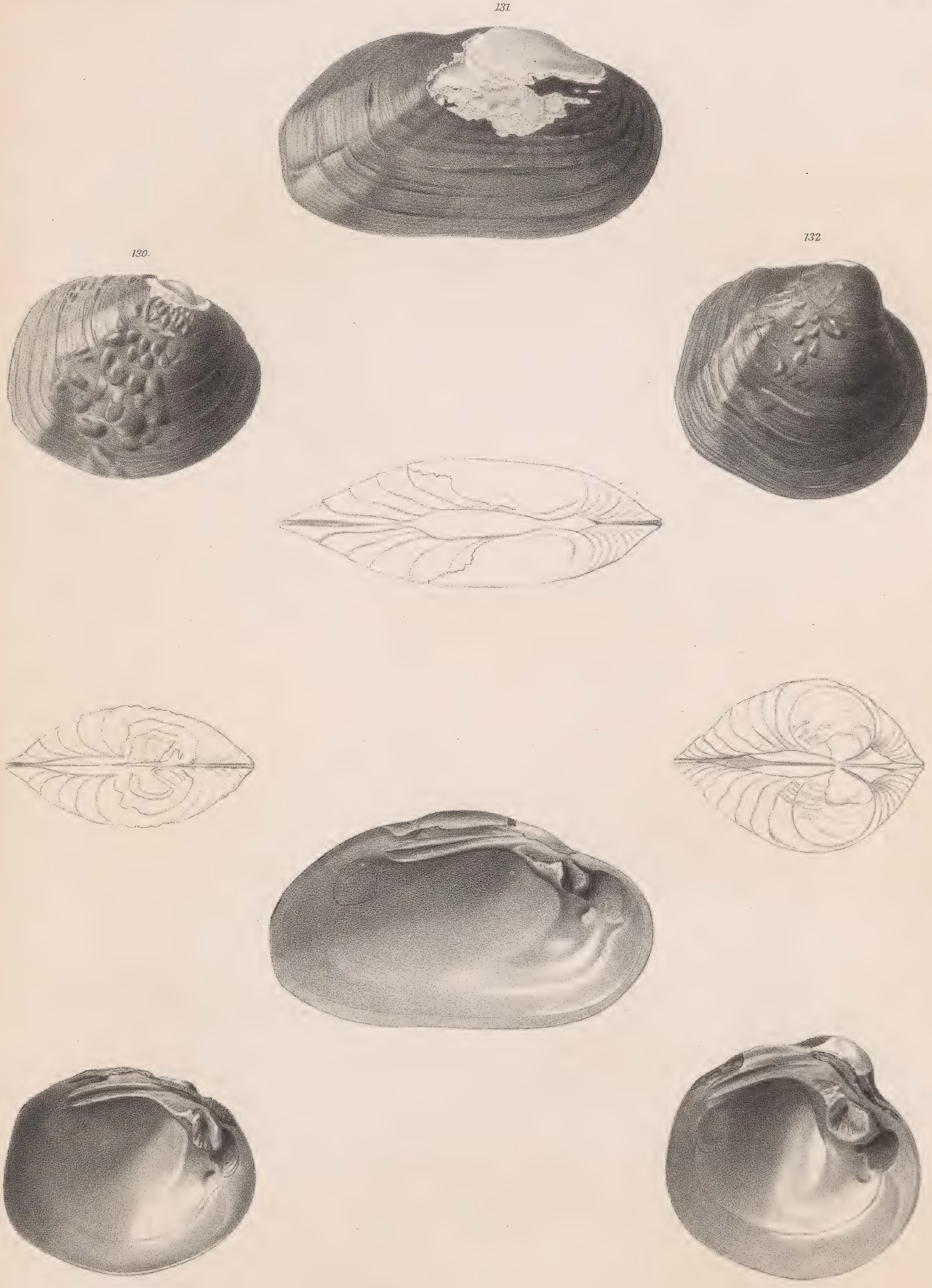
129.



127.

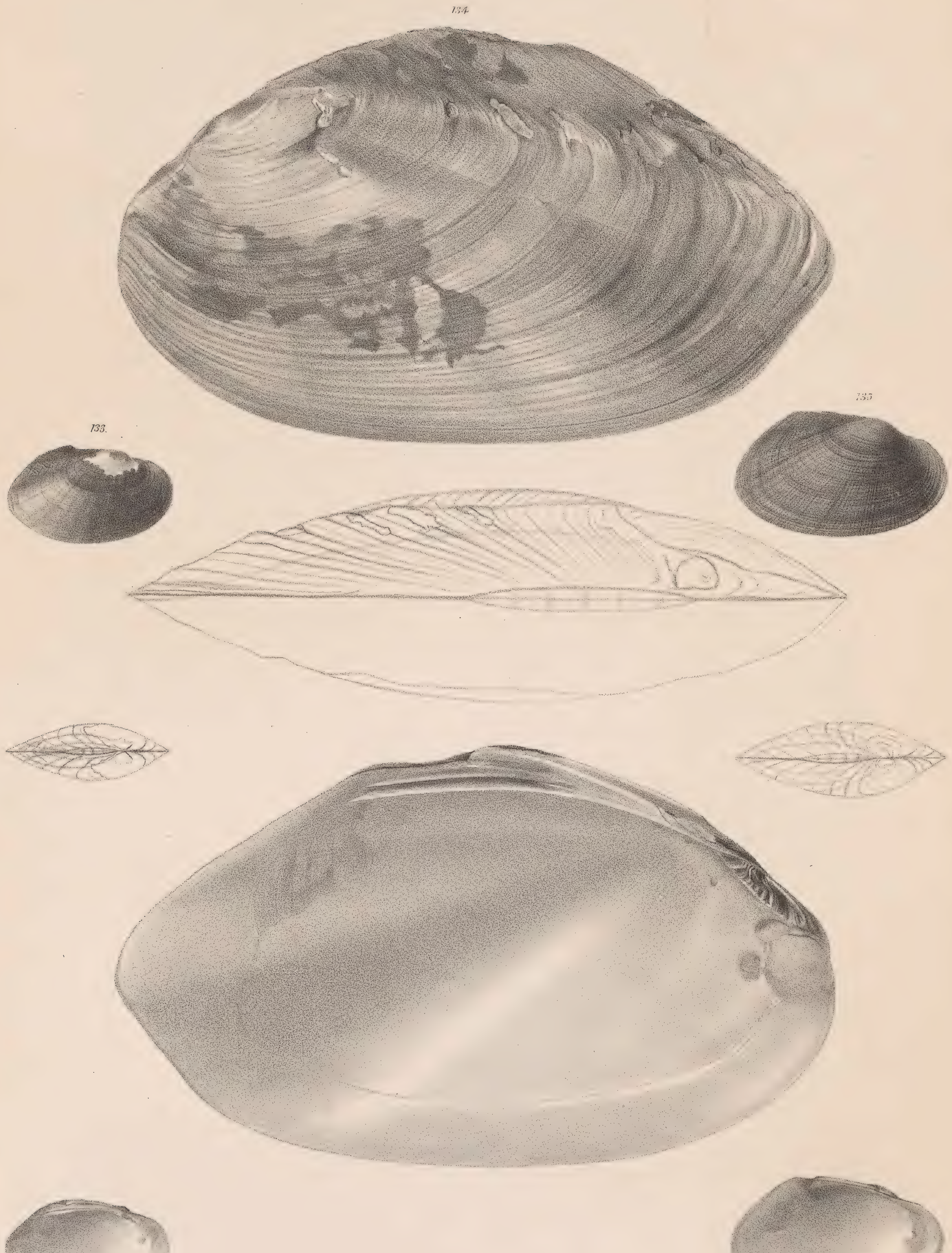
T. Sinclair's lith. Phil^{a}

127. *Unio corvunculus.*
128. *Unio vallatus.*
129. *Unio planior.*



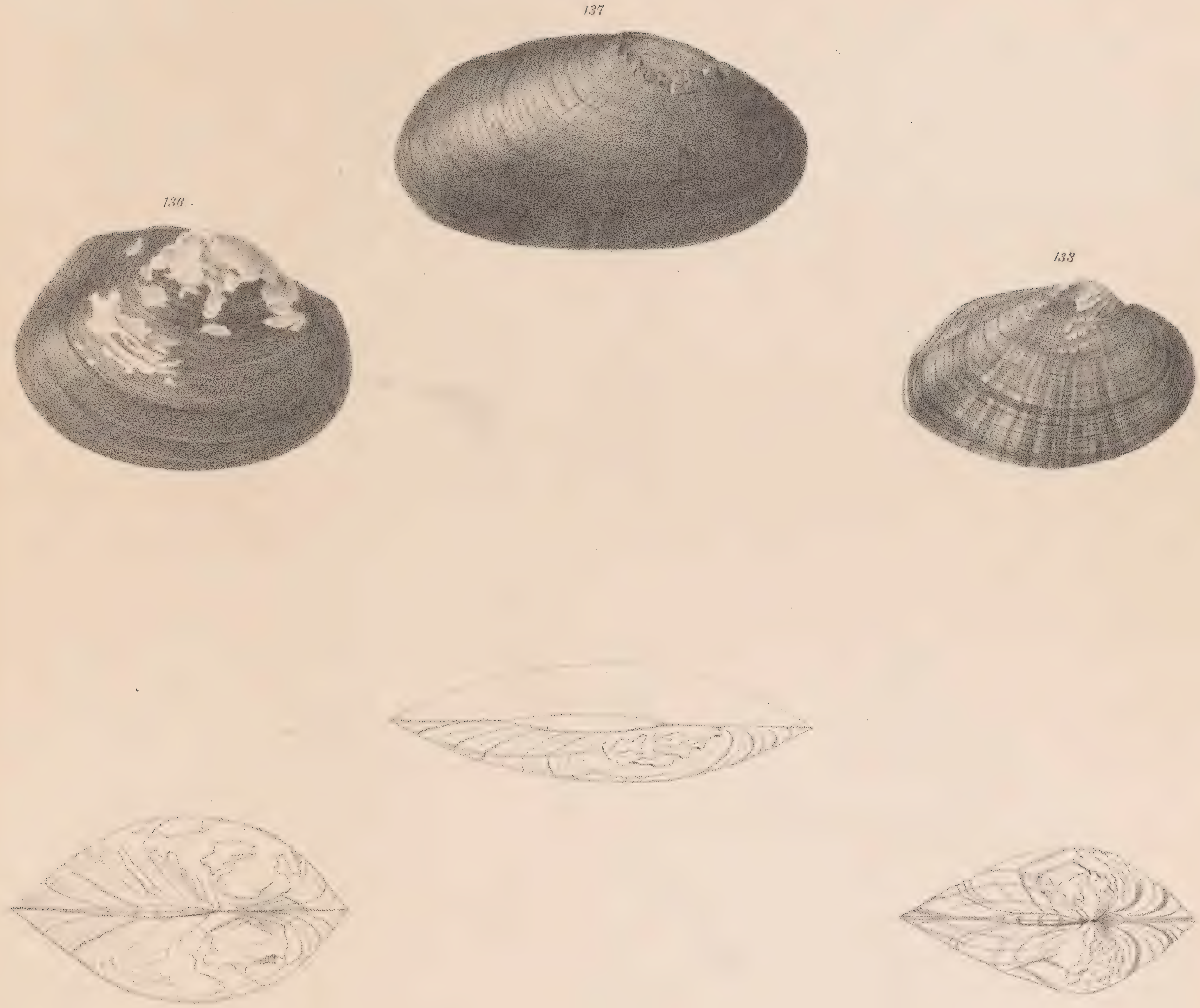
T. Sinclair's lith. Phil^a

130. *Unio refulgens.*
131. *Unio Strebelii.*
132. *Unio sphœricus.*



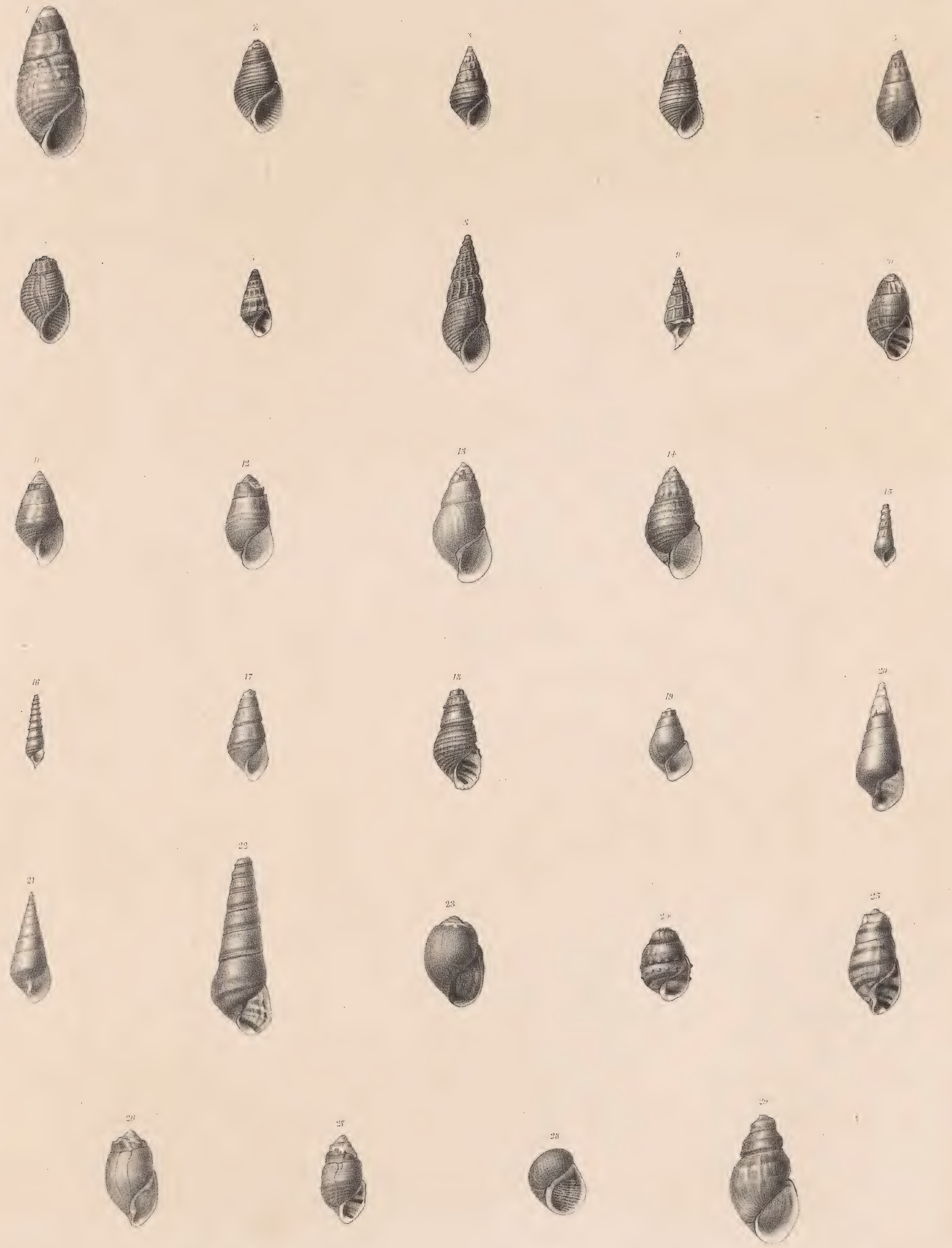
T. Sinclair's lith. Phila

133. *Unio Veracruzensis.*
134. *Unio Ortonii.*
135. *Anodonta Strebelii.*



T. Sinclair's lith. Phil.

136. *Unio prunoides.*
137. *Anodonta Napoensis.*
138. *Unio Chinensis.*



1.	Goniobasis	Wheatleyi.
2	„	similis.
3.	„	sulcata.
4.	„	arata.
5.	„	Gesnerii.
6.	„	Whitfieldensis.
7.	„	bifasciata.
8.	„	clathrata.
9.	„	Gouldiana.
10.	Goniobasis	luteocella.
11	„	Conesaugaensis.
12.	„	contigua.
13.	„	Murrayensis.
14.	„	granatoides.
15.	„	clavula.
16.	„	cochliaris.
17.	„	venusta.
18.	„	ornata.
19.	Trypanostoma	nuciforme.
20.	Trypanostoma	castaneum.
21.	„	Wheatleyi
22.	„	terebrale.
23.	Lithasia	purpurea.
24.	„	curta.
25.	„	Wheatleyi.
26.	„	cylindrica.
27.	Schizostoma	Wheatleyi.
28.	Anculosa	Downiei.
29.	Paludina	Spillmanii.

T. Sinclair's lith. Phil^a.

INDEX

TO VOL. I. TO XIII.

OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTIONS OF NEW SPECIES OF THE FAMILY UNIONIDÆ,

AND

DESCRIPTIONS OF NEW SPECIES OF THE MELANIDÆ, PALUDINÆ, HELICIDÆ, ETC.

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY AND THE ACADEMY OF NATURAL
SCIENCES OF PHILADELPHIA, FROM 1827 TO 1874.

BY

ISAAC LEA, LL.D.

VOL. III.

PHILADELPHIA:
PRINTED FOR THE AUTHOR.
COLLINS, PRINTER, 705 JAYNE STREET.
1874.

NOTICE.

The two previous indices, published in 1867 and 1869, were chiefly intended for references to general species in the previous twelve volumes. The object of this Index is to embrace the subject-matter, *anatomical and structural details, habits, etc.*, of the whole thirteen volumes, and in such an extended and analytical manner as to make every part of these volumes accessible to the student of these important and very interesting Families of the Mollusca.

For the labor of this very extensive work — the classifying of these tables—I am indebted to my friend James Lewis, M.D., of Mohawk, New York, who so ably aided me in the two previous indices. As all these papers embraced in these thirteen volumes, with all the plates, are published in, and taken from, the "Transactions of the American Philosophical Society," and the "Journal of the Academy of Natural Sciences," it will facilitate reference to these works by stating that the papers of my

Vol. 1 are printed in the Transactions of the Am. Phil. Soc., Vols. 3, 4 and 5, new series.
“ 2 “ “ “ “ “ “ 6, “
“ 3 “ “ “ “ “ “ 8, “
“ 4 “ “ “ “ “ “ 9 and 10, “
“ 5 “ “ “ “ “ “ 10, “
“ 6 “ “ Journal of the Acad. Nat. Sciences, “ 3 and 4, “
“ 7 “ “ “ “ “ “ 4, “
“ 8 “ “ “ “ “ “ 4 and 5, “
“ 9 “ “ “ “ “ “ 5, “
“ 10 “ “ “ “ “ “ 5, “
“ 11 “ “ “ “ “ “ 6, “
“ 12 “ “ “ “ “ “ 6, “
“ 13 “ “ “ “ “ “ 8, “

ORDER OF ARRANGEMENT.

Section I. Embraces new species of Unionidæ, Embryonic forms and soft parts, being *original descriptive matter*, in Vol. XIII.

Section II. Embraces new species of Univalve mollusca, being *original descriptive matter* in Vol. XIII.

Section III. Embraces *miscellaneous references* to *known species* of Unionidæ, in Vol. XIII.

Section IV. Embraces miscellaneous references to known species of Univalves, in Vol. XIII.

Section V. Embraces references to *Anatomical* and *Structural details, habits, and other peculiarities* of Unionidæ, etc. etc. etc., in Vols. I. to XIII., not embraced in former Indices.

SECTION I.

UNIONIDÆ.

NEW SPECIES.

SUBSECTIONS { UNIO,
ANODONTA,
MARGARITANA.

(NOTE. The first or a single page reference after the name of a species here refers to descriptive matter in Vol. XIII. Observations, etc.; other page references refer to incidental remarks on the species against which they occur.)

UNIO.	VOL. XIII. Page.	MISCELLANEOUS REFERENCES.
acuens. (June 4, 1872.)	31.	
amplus. (June 4, 1872.)	43.	
Andersonensis. (June 4, 1872.)	40.	
appressus. (June 13, 1871.)	16.	
attenuatus. (June 4, 1872.)	45.	
basalis. (June 4, 1872.)	52, 70.	
bellulus. (June 4, 1872.)	54.	
brevis. (June 4, 1872.)	39.	
Cahabensis. (June 13, 1871.)	21.	
circumactus. (June 13, 1871.)	19.	
cirratus. (Nov. 25, 1873.)	59.	
Conasaugaensis. (June 4, 1872.)	37.	
conspicuus. (June 4, 1872.)	38.	
corneus. (Nov. 25, 1873.)	63.	
crudus. (June 13, 1871.)	18.	
curvatus. (June 4, 1872.)	42.	
cuspidatus. (June 4, 1872.)	47.	
differtus. (June 4, 1872.)	46.	
dispansus. (June 13, 1871.)	23.	
dissimilis. (June 4, 1872.)	57.	
Dooleyensis. (Dec. 23, 1873.)	68.	
exacutus. (June 4, 1872.)	49, 48, 63.	
flavidus. (June 4, 1872.)	32.	
Gesnerii. (Dec. 23, 1873.)	69.	
globatus. (June 13, 1871.)	9.	
hastatus. (Nov. 25, 1873.)	60.	
infulgens. (Nov. 25, 1873.)	64.	
infuscus. (June 4, 1872.)	55.	
insolidus. (June 4, 1872)	44.	
invenustus. (Dec. 23, 1873.)	70.	
Irwinensis. (June 4, 1872.)	48, 51.	
Jeffreysianus. (June 13, 1871.)	27.	(Exotic.) Australia.
Lawii. (June 13, 1871.)	12, 55.	
lenticularis. (June 4, 1872.)	34.	
ligatus. (June 4, 1872.)	53, 55.	

UNIO.	Vol XIII. Page.	Miscellaneous References.
litus. (June 13, 1871.)	21.	
Macnielii. (June 15, 1869.)	29.	Soft parts, 30. (Exotic.) Central America.
oblongus. (June 4, 1872.)	56.	
obuncus. (June 13, 1871.)	13.	
pattinoides. (June 13, 1871.)	20.	
pauciplicatus. (June 4, 1872.)	33.	
Pealei. (June 13, 1871.)	30.	
radiolus. (June 13, 1871.)	25.	
radiosus. (June 13, 1871.)	17.	
ratus. (June 4, 1872.)	56.	
recurvatus. (June 13, 1871.)	14.	
rostellum. (June 4, 1872.)	48.	
Santeënsis. (June 13, 1871.)	24.	
simulans. (June 13, 1871.)	22.	
Stevensii. (June 13, 1871.)	26.	(Exotic.) South America.
strumosus. (June 4, 1872.)	61.	
subcylindraceus. (Nov. 25, 1873.)	62.	
subglobatus. (June 13, 1871.)	11, 9.	
subolivaceus. (Nov. 25, 1873.)	61.	
subparallelus. (June 4, 1872.)	50, 56.	
subsquamosus. (June 4, 1872.)	51.	
Tellicoensis. (June 4, 1872.)	35.	
Tuscumbiensis. (June 13, 1871.)	15, 13, 16, 33.	
validus. (June 13, 1871.)	10.	
vesicularis. (June 4, 1872.)	41.	
Yadkinensis. (June 4, 1872.)	36.	
ANODONTA.		
exilior. (June 13, 1871.)	28.	(Exotic.) Mexico ?
SOFT PARTS.		
UNIO.		
Hydeianus *Lea*	72.	
Rowellii *Lea*	71.	
Tappanianus *Lea*	71.	
ANODONTA.		
Leonensis *Lea*	71.	
EMBRYONIC FORMS.		
UNIO.		
Claibornensis *Lea*	73.	
concestator *Lea*	72.	
excavatus *Lea*	72.	
fallax *Lea*	73.	

Embryonic Forms. **UNIO.**	Vol. XIII. Page.	Miscellaneous References.
gibbosus *Barnes*	73.	
Nashvilleënsis *Lea*	72.	
nasutus *Say*	72.	
Othcaloogaensis *Lea*	73.	
parvus *Barnes*	72.	
purpuratus *Lam*	73.	
rubellinus *Lea*	72.	
sudus *Lea*	73.	
Tappanianus *Lea*	73.	
tortivus *Lea*	73.	
MARGARITANA.		
Spillmanii *Lea*	73.	
ANODONTA.		
Ferussaciana *Lea*	72.	
Leonensis *Lea*	72.	

SECTION II.

UNIVALVES.

NEW SPECIES.

	Vol. XIII. Page.	Miscellaneous References.
GONIOBASIS.		
baculoides. (June 15, 1869.)	66.	
Lawrencei. (June 15, 1869.)	66.	
SCHIZOSTOMA.		
Lewisii. (June 15, 1869.)	65.	
PHYSA.		
Carltonii. (June 15, 1869.)	67.	
Wolfiana. (June 15, 1869.)	67.	

SECTION III.

UNIONIDÆ.

KNOWN SPECIES.

UNIO.	Vol. XIII. Page.	Miscellaneous References.
abacus *Hald.*	16, 19.	
Abbevillensis *Lea.*	44, 54, 59, 64.	
aberrans *Lea*	56.	
aquilus *Lea*	26.	
Australis *Lam.*	28.	
Barrattii *Lea*	47, 60.	
Berlandierii *Lea*	34.	
Bigbyensis *Lea.*	10.	
Boykinianus *Lea.*	27.	
Brazosensis *Lea.*	34.	
Burkensis *Lea*	47.	
capax *Green*	11.	
Catawbensis *Lea*	43, 51.	
Chathamensis *Lea.*	69.	
Chickasawhaensis *Lea*	35.	
circulus *Lea.*	31.	
clavus *Lamarck.*	12.	
Clinchensis *Lea*	32.	
complanatus *Solander*	37, 70.	
"*complanatus group*"	25, 37.	
confertus *Lea*	25.	
Copei *Lea*	21.	
cuneolus *Lea.*	15.	
Cuvierianus *Lea*	46.	
decoratus *Lea*	44.	
dolabelloides *Lea*	17, 19.	
ebenus *Lea*	11, 14, 31.	
Edgarianus *Lea*	13, 16, 41.	
ellipsis *Lea*	31.	
errans *Lea*	69.	
fluctiger *Lea*	27.	
folliculatus *Lea*	50.	
Gastonensis *Lea*	49.	
Geddingsianus *Lea*	26.	
Genthii *Lea*	23.	
gibber *Lea*	40.	
glandaceus *Lea*	36.	
gracilis *Barnes*	34.	
Hallenbeckii *Lea*	69.	
Hazelhurstianus *Lea*	45.	
hebes *Lea*	57.	
humerosus *Lea*	37.	

UNIO.	Vol. XIII. Page.	Miscellaneous References.
lachrymosus *Lea*	22.	
lens *Lea*	35.	
Lesleyi *Lea*	12, 20.	
lugubris *Lea*	25.	
Mooresianus *Lea*	13.	
mundus *Lea*	13, 20, 32, 55.	
Murrayensis *Lea*	13.	
nasutus *Say*	50.	
naviculoides *Lea*	47.	
neglectus *Lea*	53.	
nubilus *Lea*	51.	
obliquus *Lamarck*	16, 33.	
parvus *Barnes*	42.	
pilaris *Lea*	11.	
planilateris *Conrad*	37.	
plenus *Lea*	15.	
plicatus *Lesueur*	34.	
productus *Conrad*	60.	
pullatus *Lea*	58	
purpuratus *Lamarck*	34.	
pustulatus *Lea*	22.	
pyramidatus *Lea*	14.	
pyriformis *Lea*	36.	
quadrilateris *Lea*	37.	
radiatus *Lamarck*	39.	
Raeënsis *Lea*	56.	
Raleighensis *Lea*	44.	
rostriformis *Lea*	45, 48.	
rostrum *Lea*	52.	
rotundatus *Lam*	61.	
Rowellii *Lea*	30.	
rubiginosus *Lea*	33, 40.	
rufusculus *Lea*	49, 51.	
rutilans *Lea*	24.	
Savannahensis *Lea*	46, 62, 65.	
scamnatus *Morelet*	30.	
Schoolcraftii *Lea*	22.	
sphæricus *Lea*	10.	
squameus *Lea*	52.	
striatulus *Lea*	21.	
subellipsis *Lea*	24.	
subflavus *Lea*	38.	
subgibbosus *Lea*	57.	
subrotundus *Lea*	9, 11, 19.	
Thorntonii *Lea*	19.	
Thwaitesii *Lea*	28.	
tumescens *Lea*	17, 33.	
virens *Lea*	43.	
viridiradiatus *Lea*	58.	
vittatus *Lea*	28.	

ANODONTA.		
ensiformis *Spix*	27.	
obtusa *Spix*	29.	
tortilis *Lea*	27.	

SECTION IV.

UNIVALVES.

KNOWN SPECIES.

GONIOBASIS.	VOL. XIII. Page.	MISCELLANEOUS REFERENCES.
Christyi *Lea*	66.	
fascinans *Lea*	66, 67.	
impressa *Lea*	65.	
MELANIA.		
transversa	27.	
PHYSA.		
Cooperi *Tryon*	68.	
Lordi *Baird*	67.	

SECTION V.

SUPPLEMENTARY INDEX, EMBRACING REFERENCES TO ANATOMICAL AND STRUCTURAL DETAILS, HABITS, AND OTHER PECULIARITIES OF UNIONES, ETC. ETC., IN VOLS. I. TO XIII.

ABDOMINAL sack, end not open. *U. Berlandierii.* VIII. 52.
Abdominal sack, pouched. [Note to *U. ellipsis.*] VI. 63.
Aberrant forms. PLAGIODON and TRIQUETRA. VI. Introduction.
Abnormal double teeth. I. 22.
  “ lateral teeth, single in both valves. *U. dolosus.* VIII. 80.
Absence of dorsal cicatrix. *An. Schröteriana.* V. 49.
  “ of lateral teeth in MARGARITANA. [Foot-note.] I. 44.
Absence of papillæ on anal opening, remarkable. *U. triangularis* and *cylindricus.* X. 57. [See papillæ absent, etc.]
Abundance of Uniones west of the Alleghany Mountains. I. 20.
Account of *Unio spinosus*, Major LeConte's. II. 59.
Adams, H. and A., on GYROTOMA. IX. 67.
Adductor muscles, I. 28. Large in *M. margaritifera*, VII. 43. *U. lævissimus*, X. 61. *U. multiplicatus*, VII. 40.
Adductor muscles, very large in *U. ovatus*, X. 71. *U. tuberculatus*, X. 62. Of embryos, VI. 45.
Agassiz on syphons of *Marg. rugosa.* X. 82.
Alated shells. I. 56, 57. [See Winged or Alate Uniones.]
Alleghany Mountains divide species, eastern and western. I. 136.
Alternating horns of *U. cornutus.* I. 73.
AMNICOLA allied to MELANIDÆ. [Foot note.] IX. 40.
AMPULLARIA found in dry bed of a brook. II. 16.
Anal and superanal opening, enormous. [*U. tuberculatus.*] X. 61, 62.
Anal opening black. *Marg. margaritifera.* VII. 43.
  “ “ maculate. *An. Lewisii.* VIII. 45.
  “ “ “ with black. *U. obtusus.* X. 42.
  “ “ peculiar. *Mon. Pazii*, XII. 34. *U. stramineus.* VII. 41.
Anal opening without papillæ. Group of Uniones having. X. 68.
Anal opening without papillæ, not a generic test. X. 83. [See Papillæ absent, etc.]
Anal opening without papillæ, species having. [See Papillæ absent, etc.]
Anatomical structure, peculiar. *U. Prattii.* VII. 25.
Anatomy and habits of ANCULOSUS. IV. 14.
  “ of *An. latomarginata* like that of *An. Wymanii.* X. 30.
Anchored by a byssus, characteristic of *U acutissimus* and *Conradicus.* X. 47.
Anculotus costatus like *Mel. occidentalis.* [Foot-note.] III. 11.
Anculotus carinatus and *Kirtlandianus*, Anth. identical with *Mel. inflata.* III. 10.
Androgynous. Supposed character of Uniones. II. 49.
Angular or carinate PALUDINA [*orientalis*]. XI. 72.
Angulate posterior slope. [*U. donaciformis.*] I. 10 [See Umbonial slope, also Posterior slope.]
Angustatus group. [*U. naviculoides.*] VI. 95.
Animalcules, food of UNIONES, I. 4. Not food of UNIONES, I. 76.
Animals of *Valvata bicarinata*, and *tricarinata* differ. IV. 21.
Anodonta Chaiziana, a SPATHA. XI. 41.
  “ *edentula* not an ANODONTA, defined by Agassiz. X. 89.
Anodonta Ferussaciana not an ANODONTA, defined by Agassiz. X. 87.
Anodonta incerta in Georgia. [Foot-note.] III. 65.
ANODONTÆ produce more young than UNIONES. II. 51.
Anodontæ Allied—*Buchanensis* to *Ferussaciana*, II. 48. *Californiensis* to *Nuttalliana*, V. 42. *Dahomeyensis* to *Senegalensis*, VII. 79. *Dallasiana* to *Kennecottii* and *Simpsoniana*, XI. 34. *Dariensis* to *fluviatilis*, VII. 49. *Denigrata* to *Ferussaciana*, V. 41. *Ferruginea* to *undulata*, III. 63. *Footiana* to *fragilis*, III. 64. *Granadensis* to *inæquivalva* and *lenticularis*, XII. 49. *Hallenbeckii* to *Gesnerii*, VII. 50. *Harpethensis* to *decora*, III. 62. *Kennecottii to Pepiniana*, IX. 36. *Lenticularis* to *inæquivalvis*, XII. 51. *Lewisii* to *fluviatilis*, VIII. 45. *Moricandii* to *Forbesiana*, X. 33. *Opaca* to *fluviatilis*, V. 42. *Oregonensis* to *Benedictii*, II. 81. *Salmonia* to *Ferussaciana*, II. 46. *Shæferiana* to *tetragona*, V. 45. *Simpsoniana* to *Oregonensis*, IX. 35. *Subcylindracea* to *Ferussaciana*, II. 106. *Tenuis* to *crepera*, VII. 56. *Wardiana* to *Ferussaciana*, II. 47. *Williamsii* to *implicata*, XI. 32.
Anomalous teeth of *U. monodontus.* I. 98.

Anterior and posterior margins of Embryonic Uniones equal. VI. 44. [See Embryos.]
Anterior and posterior muscles. I. 4.
" cicatrix. I. 4.
" cicatrices confluent. [*U. Ingallsianus.*] V. 38.
" " separate in So. American UNIONES. X. 17.
Anterior cicatrices, three distinct. [*U. Africanus.*] VI. 21. [See Cicatrix 3d anterior.]
Anterior slope cordate. [*Plagiodon Isocardioides.*] VI. 39.
Anterior slope sharply truncate. [*U. crebrivittatus.*] XI. 47.
Anterior tractor muscles, large. [*U. lævissimus.*] X. 61.
" wing connate. [*U. lævissimus.*] I. 59.
Anus crenulate. *Marg. elliptica*, VIII. 111. *Marg. Tombigbeënsis.* VIII. 112.
Anus crenulate. *U. Berlandierii*, VIII. 52. *U. obtusus.* X. 42.
Anus corrugate. *Marg. triangulata.* VII. 47.
" peculiar. *U. stramineus.* VII. 41.
" very small *U. Forsheyi.* VIII. 40.
APHRODITE, a genus of estuary shells. I. 223.
Apex obtuse. [*Pal. obtusa.*] IV. 13.
Approximation of beaks of *U. donaciformis.* I. 10.
Arch between teeth of *U. camptodon*, VII. 37. *U. Showalterii*, VIII. 79. *U. Woodwardianus*, VII. 18, 37.
Arched ridge, umbonial slope of *U. brevidens.* I. 197.
" plate, termination of cardinal teeth of *U. Caldwellii.* VII. 83.
Arcuate shells of adult *U. lazarus.* V. 15.
Arrow-head marks, *U. cylindricus*, I. 26, 172. *U. intermedius*, V. 23. *U. metanever*, I. 26, V. 23, IX. 10, III. 49. *U. rubellinus*, VI. 71. *U. sparsus*, III. 81. *U. triangularis*, XI. 21. *U. Wardii*, IX. 10.
Arrow-head points of Embryos. VI. 48, 49. [See Embryos.]
Arrangement of ova of *An. undulata.* II. 52.
" " spines of *U. spinosus.* II. 58.
Articulation of teeth of So. American UNIONES. XII. 33.
Asiatic UNIONES—cardinal teeth of. XI. 65.
Attachment of mantle to cavity of shell. [*Marg. margaritifera.*] VII. 43.
Band, transverse, on *An. decora.* II. 64.
" yellow, on *U. persulcatus.* VII. 74.
Barnes and Lamarck on *U. alatus.* I. 57.
Bartram and *Unio spinosus.* II. 60.
Basal margin, great width of. *U. funebralis.* X. 15.
Beaks and disk polished. *U. Whiteianus.* V. 15.
" angulate and approximate. *U. donaciformis.* I. 10.
Beaks compressed. *U. securis.* I. 52.
" " with several double concentric undulations. *M. complanata.* I. 63.
Beaks concentrically and roughly wrinkled. *U. subparallelus.* XIII. 50.
Beaks covered with numerous literations to the point. *U. Nicklinianus.* I. 140.
Beaks finely undulate. *U. Muhlfeldianus*, II. 41. *An. Pepiniana*, II. 96.
Beaks, divergent folds of, on So. American UNIONES. III. 38, XII. 24.
Beaks incurved and undulate. *U. subovatus.* I. 128
" irregularly and finely undulate. *Marg. Holstonia.* II. 42.
Beaks, medial and terminal. I. 28.
" minutely and closely undulate. *U. graniferus.* II. 70.
Beaks of So. American UNIONES with divergent costæ. X. 24.
Beaks, tips of—
  acuminate, not folded. *Mon. Pazii.* XII. 34.
  angular. *U. Hainesianus.* VI. 9.
  closely and finely undulate. *An. Kennerlyi.* VIII. 113.
  closely corrugate. *U. rubiginosus.* VIII. 101. [See I. 41.]
  closely and minutely undulate. *U. Mardinensis* and *Orphaensis.* XII. 10, 12.
  closely undulate. *U. verutus.* VIII. 17.
  coarsely undulate. *U. cicer*, VIII. 97. *U. Forbesianus*, V. 20. *U. ineptus*, V. 17. *U. mediocris* XI. 28. *U. merus.* V. 16. *U. Pratii*, VII. 25. *U. turgidus*, VIII. 67. *An. Shæfferiana*, V. 44.
  compressed and pointed. *U. Lamarckianus*, V. 23. *U. securis*, V. 23.
  concentrically and rugosely undulate. *Marg. Tombigbeënsis*, VIII. 112. *U. Germanus*, XI. 53, 54.
  concentrically folded. *U. Cromwellii.* XII. 19.
  " undulate. *An. denigrata*, V. 41. *An. Wardiana*, II. 47. *U. Bairdianus*, VIII. 44. *U. Bisselianus*, XII. 47. *U. Columbensis*, VI. 75. *U. corvunculus*, XII. 74. *U. cuprinus*, I. 104. *U. decoratus*, V. 13. *U. Haleianus*, III. 85. *U. Hallenbeckii*, VIII. 10. *U. incurvus*, I. 103. *U. Jewettii*, XII. 36. *U. salebrosus*, VIII. 14. *U. Texasensis*, VIII. 39.
  corrugate—*U. negatus*, VIII. 81. Corrugated—*U. Chinensis*, XII. 55. *U. Emasaensis*, XII. 14. *U. Homsensis*, XII. 9.
  corrugated and folded. *U. Shanghaiensis.* VII. 61.
  elevated, incurved. *U. varicosus.* I. 100.
  faintly undulate. *U. Higginsii.* IX. 11.
  finely and closely undulate. *An. Kennerlyi.* VIII. 113.
  finely and concentrically undulate. *U. Hallenbeckii.* VIII. 11.
  finely undulate. *An. Californiensis*, V. 42. *An. globosa*, III. 79. *U. Conradicus*, I. 175. *U. denigatus*, VII. 19. *U. dispar*, VIII. 9. *U. pictus*, I. 186. *U. pressus*, I. 65.
  flattened and minutely undulate. *An. incerta*, I. 158.
  flattened, finely undulate. *An. Couperiana.* III. 65.
  flattened, incurved. *U. elegans.* I. 93.
  folded. *U. asperulus*, XII. 40, 41. *U. divaricatus*, I. 177. *U. humilis*, VI. 16. *U. nucleus*, VI. 27. *U. Paranensis*, I. 212. *U. phaselus*, VI. 16.
  granular. *An. Kennicottii*, IX. 36. *An. ovata*, II. 2. *An. Stewartiana*, I. 159.

Beaks granulate. *An. Dallasiana*, XI. 34. *An. gigantea*, II. 1. *An. plana*, I. 160. *U. dignatus*, XI. 56. *U. Popeii*, VIII. 54. *U. pustulatus*, I. 89. *U. rusticus*, VI. 14.
  granulate and undulate. *U. granulatus*. XI. 52.
  " in a short double series. *An. Stewartiana*. I. 159.
  irregularly and concentrically undulate. *U. obnubilus*. VI. 84.
  irregularly and minutely undulate. *An. lacustris*, VIII. 46. *U. fallax*, VI. 79. *U. viridicatus*, VIII. 19.
  irregularly corrugated. *U. Ferussacianus*, XII. 15.
  irregularly undulate. *U. obscurus*, II. 7. *U. pulcher*, II. 6.
  longitudinally folded. *U. Paranensis*. I. 211.
  minutely and closely plicate. *U. rufofusculus*. XII. 43.
  minutely and concentrically undulate. *An. subcylindracea*. II. 106.
  minutely and granularly undulate. *U. rasus*. XI. 51.
  minutely and irregularly undulate. *An. Henryana*, VIII. 55. *Mon. rhomboidea*, VII. 81.
  minutely and obliquely undulate. *An. Senegalensis*. VII. 78.
  minutely folded. *U. tumidulus*. VI. 16.
  " granulate. *U. Bengalensis*, II. 3. *U. Popeii*, VIII. 54.
  minutely undulate. *An. argentea*, III. 61. *An. Buchanensis*, II. 48. *An. Showalterii*, IX. 37. *An. subcylindracea*, II. 106. *An. tenuis*, VII. 55. *An. Trautwiniana*, V. 43. *Marg. minor*, IV. 56. *Monocond. Mardinensis*, XII. 13. *Mon. Wheatleyi*, X. 36. *U. Barrattii*, V. 12. *U. Bengalensis*, II. 3. *U. Berlandierii*, VIII. 51. *U. Brazosensis*, XII. 69. *U. Caldwellii*, VII. 83. *U. dolosus*, VIII. 79. *U. hyalinus*, IV. 43. *U. inusitatis*, VIII. 15. *U. Lazarus*, V. 15. *U. lenior*, III. 43. *U. Lincecumii*, XII. 72. *U. melleus*, VII. 68. *U. Mosulensis*, XI. 57. *U. Nashvillianus*, I. 212. *U. Novi Eboraci*, II. 104. *U. occultus*, IV. 37. *U. Orontesensis*, X. 57. *U. Othcaloogaensis*, VI. 74. *U. pauciplicatus*, XIII. 34. *U. pellucidus*, IV. 45. *U. penicillatus*, VII. 21. *U. perstriatus*, V. 11. *U. pilatus*, XII. 41, 42. *U. planicostatus*, VIII. 36. *U. Rowellii*, VII. 74. *U. scitulus*, VIII. 24. *U. Shurtleffianus*, VI. 22. *U. soleniformis*, I. 97. *U. sparus*, XII. 67. *U. spatulatus*, IV. 54. *U. Stonensis*, III. 33. *U. Tuomeyi*, V. 12. *U. Vanuxemii*, II. 36.
  minutely wrinkled. *U. Abbevillensis*. VI. 51.
  not undulate. *U. Saladoensis*. VIII. 53.
  obliquely and closely undulate. *U. Damascensis*. XI. 59, 60.
  plicate. *U. Burroughianus*, I. 180. [See Footnote I. 173.] *U. Murchisonianus*, I. 146.
  pointed. *An. Schröteriana*, V. 48. *U. donaciformis*, I. 94. *U. Gabbianus*, XII. 55. *U. Nicaraguaensis*, XII. 56.
  pointed, angular. *U. Lamarckianus*. V. 22.
  " having two or three minute elevations. *U. gracilis*. I. 66.
Beaks radiately folded. *U. Burroughianus*, *U. lacteolus* and *U. parallelopipedon*, I. 173. *U. parcus*, XII. 22.
  radiately undulate. *U. Æthiops*, X. 14. *U. apprimus*, XII. 23. *U. Demeraraensis*, VII. 71. *U. disculus*, X. 22. *U. divaricatus*, I. 177. *U. evitatus*, XII. 39. *U. gratus*, X. 19. *U. locellus*, XII. 25. *U. mutabilis*, VII. 66. *U. Paramattensis*, XI. 64, 65. *U. patelloides*, X. 20. *U. peculiaris*, XII. 25, 26. *U. piger*, X. 24. *U. Uruguayensis*, X. 25. *U. Wymanii*, X. 18.
  radiately undulate, coarsely. *U. trifidus*. X. 23.
  radiately undulate, minutely. *U. occatus*. X. 34.
  " " rugosely. *U. lepidior*. X. 26.
  radiating folds on. *U. Burroughianus* and *Wynegungaensis*, VII. 90. *U. faba*, V. 16.
  recurved and incurved. *U. pinguis*, VI. 78. *U. pyramidatus*, I. 119.
  regularly undulate. *U. apicinus*, VI. 76. *U. Rutersvillensis*, VIII. 38.
  rough. *U. cæruleus*. I. 106.
  roughly undulate. *U. Camelopardilis*. VIII. 37.
  " " in double series. *An. Lewisii*. VIII. 44.
  rugose. *U. Wardii*. IX. 9.
  rugosely granular. *An. Lewisii*. VIII. 44.
  " undulate, *M. Georgiana*, VII. 45. *An. virens*, V. 47. *M. quadrata*, IX. 33. *M. Spillmanii*, VIII. 109. *M. triangulata*, VII. 46. *U. Blandianus*, VI. 65. *U. Eightsii*, VIII. 49. *U. insulsis*, VIII. 57. *U. pertenuis*, XI. 12. *U. pudicus*, VIII. 28. *U. pullatus*, V. 57. *U. striatulus*, VIII. 60. *U. subsquamosus*, XIII. 51. *U. viridicatus*, VI. 87.
  rugosely wrinkled. *An. Linnæana*, V. 45. *An. virens*, V. 47.
  scarcely prominent, pointed. *U. tenuissimus*, I. 68.
  " undulate. *U. Heermannii*. IX. 17.
  simple. *U. ellipsiformis*. IV. 54.
  slightly concentrically undulate. *U. patulus*. I. 55.
  " undulate. *An. Salmonia*, II. 46. *Dipsas discoideus*, I. 187. *U. infuscus*, XIII. 55. *U. Modioliformis*, I. 209. *U. nitens*, III. 43. *U. Sampsonii*, IX. 14. *U. subangulatus*, III. 47.
  smooth. *An. Wymanii*. X. 27.
  somewhat undulate. *U. tripartitus*. XI. 61.
  strongly undulate. *Marg. deltoidea*. II. 43.
  subconcentrically folded. *An. pavonia* and *Showalterii*. IX. 38.
  subconcentrically granular. *U. germanus* and *parvus*. XI. 53.
  subconcentrically undulate. *Marg. Elliottii*, VII. 44. *M. Tombigbeënsis*, VIII. 112. *U. aquilus*, VI. 92. *U. modicus*, VII. 22. *U. Texasensis*, VIII. 42.
  transversely and coarsely undulate. *Marg. Connasaugaensis*. VII. 47.
  transversal, wrinkled. *U. confertus*. I. 216.
  undulate. *An. Dunlapiana*, III. 87. *An. Footiana*, III. 63. *An. gracilis*, VII. 58. *An. Nuttalliana*, II. 77. *An. oblita*, V. 46. *An. opaca*, V. 41. *An. Oregonensis*, II. 81. *An. Simpson-*

Beaks—
iana, IX. 34. *An. subcrassa*, VII. 55. *An. virgulata*, IX. 35. *An. Wahlamatensis*, II. 78. *An. Williamsii*, XI. 31. *An. Youkanensis*, XII. 47. *Mon. discoidea*, I. 187. *U. Aferulus*, XI. 38. *U. ahenus*, IV. 38. *U. amabilis*, XII. 17, 18. *U. arctior*, II. 10. *U. Bigbyensis*, III. 75. *U. Cambodiensis*, VI. 33. *U. conspicuus*, XIII. 38. *U. contractus*, IX. 25. *U. Copei*, XII. 67, 68. *U. creperus*, II. 33. *U. Cumingii*, VII. 59. *U. diminutus*, VII. 72. *U. Dunlapianus*, III. 87. *U. emarginatus*, I. 174. *U. Emmonsii*, VIII. 61. *U. exacutus*, XIII. 49. *U. favosus*, VI. 58. *U. Florentinus*, VIII. 68. *U. fucatus*, VIII. 35. *U. gracilentus*, VIII. 62. *U. Haleianus*, III. 85. *U. hebes*, V. 23, 24. *U. Hopetonensis*, II. 30. *U. insolidus*, XIII. 44. *U. interruptus*, II. 15. *U. Irwinensis*, XIII. 48. *U. Kirkii*, XI. 36. *U. lens*, I. 90. *U. lineatus*, III. 44. *U. Menkianus*, II. 76. *U. Natalensis*, XI. 63, 64. *U. navigioliformis*, VII. 64. *U. nigerrimus*, V. 25. *U. Nyassaensis*, XI. 37. *U. percoarctatus*, VIII. 63. *U. perlatus*, XI. 20. *U. Prevostianus*, V. 25. *U. proprius*, XII. 16. *U. quadrilaterus*, XI. 9. *U. rostriformis*, VI. 64. *U. sagittæformis*, V. 33. *U. Savannahensis*, VI. 81. *U. scobinatus*, VI. 19. *U. solidus*, II. 14. *U. speciosus*, IX. 30. *U. sublatus*, VI. 82. *U. sudus*, VII. 12. *U. Verreauianus*, VI. 22. *U. viridulus*, XI. 15. *U. Woodianus*, I. 155. *U. Zeiglerianus*, II. 32.
undulate—granulate. *U. delicatus*. XI. 63.
" in double series. *An. Danielsii*. VIII. 47.
undulate, touching. *U. calceolus*. I. 8.
undulations cover a large space. *U. Damascensis* and *Orontesensis*, XI. 60.
undulations with double curves. *An. Tryonii*. XI. 33.
with a double row of granules or undulations. *An. Dallasiana*, *Kennecottii*, and *Simpsoniana*. XI. 34.
with a double row of rough undulations. *An. Texasensis*. VIII. 48.
with a double row of small angular undulations. *U. Forsheyi*. VIII. 39.
with a double row of undulations. *U. gravidens*. VI. 12.
with a double series of undulations. *An. decora*, II. 64. *U. Topekaensis*, XII. 74.
with a few coarse undulations. *An. Bealei* and *Leonensis*, XI. 30. *U. Chunii*, IX. 19.
with a few irregular undulations. *An. modesta*, VIII. 47. *U. extensus*, VI. 68. *U. rubellinus*, VI. 70. *U. rutilans*, VI. 59.
with a few parallel undulations. *U. Pybasii*. VIII. 71.
with a few rough undulations. *U. radians*. VII. 20.
with a few small granules. *U. substriatus*, VI. 20.
with a few small undulations. *U. coccineus*, VIII. 86. *U. macrodon*, IX. 15.
Beaks with a few subconcentric undulations. *Marg. elliptica*. VIII. 110.
with a few undulations. *Mon. compressa*. XI. 35.
with a line of small folds anteriorly. *U. Hainesianus*. VI. 9.
with close parallel undulations. *U. Bengalensis*. II. 3.
with coarse undulations indicated. *U. fabaceus*. VIII. 95.
with coarse undulations. *Marg. Alabamensis* and *Tombigbeënsis*. VIII. 108, 112.
with concentric folds. *U. Jamesianus*. VI. 53.
with concentric undulations. *U. Elliottii*. VI. 56.
with divaricate folds. *U. divaricatus*. I. 176.
with divaricate zigzag undulations. *U. Wynegungaensis*. VII. 89.
with divergent and reëntering ribs. *U. Wheatleyianus*. VI. 28.
with diverging ribs. *U. Dunkerianus*. VI. 25, 26.
with diverging undulations. *U. cæruleus*. I. 105.
with double concentric undulations. *U. decoratus*, V. 13. *U. iris*, I. 53. *U. pressus*, I. 64.
with double undulations. *An. Harpethensis*, III. 62. *An. Maryattana*, III. 64.
with fine nearly parallel undulations. *U. glaber*. II. 34.
with fine undulations. *U. creperus*, II. 33. *U. Zeiglerianus*, II. 32.
with flexuose rugosities. *U. multistriatus*. I. 102.
with large undulations. *An. Arkensensis*, V. 49, 50. *An. Newtonensis*. II. 80. *An. pavonia*, II. 79. *Marg. Curreyiana*, III. 61.
with minute subconcentric undulations. *U. validus*. XIII. 10
with no undulations. *Iridina cœlestis*, II. 82. *U. olivarius*, I. 118. *U. Saladoensis*, VIII. 52.
with numerous double undulations. *U. trossulus*. IV. 36.
with numerous minute raised rays. *U. bulloides*. VII. 82.
with numerous small distinct undulations. *U. Africanus*. VI. 21.
with numerous small folds. *U. eximius*. VI. 15.
with numerous small undulations. *U. contradens*. II. 75.
with numerous undulations. *U. multiplicatus*, I. 75.
without concentric undulations. *U. zigzag*. I. 54.
without undulations. *U. exiguus*. II. 30.
with radiate folds. *U. Burroughianus*, VII. 90. *U. delodontus*, III. 38. *U. Tennesseënsis*, III. 38. *U. Wynegungaensis*, VII. 90.
with raised striæ. *U. Schwerzenbackii* and *Vescoi*. XI. 58.
with remarkable undulations. *U. iris*. II. 30.
with rugose undulations indicated. *An. anaticulus*. VIII. 97.
with several subconcentric undulations. *U. ochraceus*. I. 69.
with short divergent reëntering ribs. *U. suavidicus*. VI. 30.
with short divergent ribs. *U. Brownii*. VI. 27.

Beaks with short radiated folds. *U. lacteolus.* I. 153, 173.
with six subelliptical undulations. *Symph. bialata.* I. 60.
with small concentric folds. *An. ferruginea.* III. 63.
with small concentric undulations. *U. incurvus.* I. 107.
with small folds. *U. Riddellii.* IX. 21.
with small irregular transverse undulations. *U. Jonesii.* VIII. 22.
with small subparallel folds. *U. Postellii.* VII. 32.
with small transverse undulations. *An. Dariensis*, VII. 48. *U. viridans*, VIII. 20.
with small undulations. *U. Boydianus*, III. 54. *U. multiplicatus*, I. 81.
with one or two undulations. *U. coccineus*, II. 12. *U. solidus*, II. 13.
with two or three large irregular undulations. *U. Houstonensis.* VIII. 41.
with two or three large undulations. *U. instructus.* VIII. 86.
with two or three small subconcentric undulations. *U. rubiginosus.* VIII. 81.
with two or three small undulations. *An. argentea*, III. 62. *An. Ferussaciana*, I. 157.
with two rows of granules. *U. delicatus.* XI. 63.
with three double undulations. *An. Danielsii.* VIII. 48.
with three or four undulations. *U. perpictus.* VIII. 32
with three or four large undulations. *An. Arkansensis.* V. 49.
with wave-like granulations. *U. granulatus.* XI. 53.
with six nearly parallel undulations. *An. magnifica.* I. 156.
with undulations simple, nearly concentric. *An. denigrata.* V. 41.
with very minute undulations. *U. venustus.* II. 4.
with small undulations. *U. orientalis.* III. 59.
Bialate Uniones. *U. Housei*, VI. 11. *U. Myersianus*, VI. 10. *U. Stevensii*, XIII. 26.
Biangular Uniones. III. 35, 42.
Bisexual or hermaphrodite character of Uniones. I. 3.
Black and brownish shells. I. 26.
" border. *U. ebenus* and *Showalterii.* VIII. 77.
" dots on mantle. *U. dolabræformis* and *lineatus.* X. 50.
Blackish epidermis. *U. Granadensis.* XII. 54.
" pigment of *Marg. margaritifera.* VII. 43. [Foot-note.]
Black round spot on mantle. *U. luteolus.* X. 38.
" spongy mass, or caruncle. *U. parvus*, VIII. 39. [See Spongy Mass.]
Black spot on mantle. *U. Claibornensis.* X. 72.
Blainville on position of parts. I. 3.
Border, horn color. *An. lato-marginata* and *tenebricus.* I. 188, 191.
Branchiæ attached by a filamentary process. *U. tetricus.* VII. 14.
Branchiæ attached by a thread-like muscle. *U. limatulus.* X. 43.
Branchiæ crimpled. [Foot-note.] X. 83.
" free or attached. *U. multiplicatus.* VII. 43.
" free or not free. *U. Novi-Eboraci.* X. 55.
" free or not free, not a generic test. X. 55.
" inner longer than outer. *U. decisus.* X. 41.
" —offsetting posterior point. *M. margaritifera* and *U. monodontus.* X. 58.
Branchiæ, of Anodontæ, whole lobe filled. II. 51.
" of uniform size characteristic of *An. Wymanii.* X. 28.
Branchial leaves, singular construction of. *U. Prattii.* VII. 25.
Branchial opening papillose in an unusual manner. *U. subangulatus.* X. 44.
Branchial opening peculiar. *U. Berlandierii.* VIII. 52.
" opening with peculiar papillæ. *U. spinosus.* X. 49.
Branchial ovisacks. [See Ovisacks.]
" uteri of *An. Showalterii*, a generic test. IX. 38.
Branchial uteri, unusual forms of. VI. 45.
" uterus and sacks, defined. [Foot-note.] VI. 56.
Branchial uterus—all the four leaves of branchiæ filled with ova. *U. Kleinianus*, X. 40, 53, 64. *U. multiplicatus*, III. 71. VI. 46. VII. 9. 40. X. 53, 64. *U. rubiginosus*, III. 71. VII. 40. X. 52, 53, 64. *U. subrotundus*, X. 53, 64.
Branchial uterus enormous. *U. excavatus.* VI. 72.
" uterus folded or plicate. *U. Foremanianus*, X. 79, 80. *U. phaseolus* and *Woodwardianus*, II. 51. VII. 9, 17, 18, 38. X. 79, 80.
Branchial uterus largely filled. *Marg. complanata.* X. 84.
Branchial uterus like that of *U. cariosus.* *U. ventricosus.* VII. 42.
Branchial uterus like that of *U. heterodon*, X. 78. *U. fallax*, VI. 79. *U. glans*, X. 41. *U. parvus*, VII. 39.
Branchial uterus proposed instead of oviducts. VI. 43.
" uterus—remarkable forms of. VI. 45.
" uterus singularly formed. *An. edentula* and *undulata.* X. 87.
Branching papillæ. *Marg. margaritifera*, VII. 43. X. 63. *U. subrotundus*, X. 63.
Brown maculations of mantle of Margaritana. X. 84.
" maculations of mantle of *U. penitus*, like those of Margaritana. X. 76.
Byssus, at maturity. *U. acutissimus*, *Conradicus* and *rubellinus.* VI. 71.
Byssus, cicatrix of. VI. 71. X. 46, 47. XI. 50.
" filamentous. X. 46, 47.
" of young Uniones. III. 68. X. 47.
" of Mytilacea. I. 19.
Callus, on dorsal margin. *An. Arkansensis*, V. 49. *An. denigrata*, V. 41. *An. edentula*, V. 49. *An. Showalterii*, IX. 38. *An. subcrassa*, VII. 55. [See Rudimentary Teeth.]
Callosity, double tubercular; dorsal margin of *An. Shæfferiana.* V. 44.

Callous margin. *An. Williamsii.* XI. 32.

Callus, small longitudinal, on dorsal line. *An. Senegalensis.* VII. 78.

Callus under the beak. *Mycetopus emarginatus.* X. 35.

Capillary lines, minute. *U. Camelopardilis.* VIII. 37.

" " or rays of *U. Foremanianus*, III. 86. VII. 36.

Capillary rays, indistinct. *An. Couperiana.* III. 65.

" " *U. turgidulus*, VIII. 67. *U. persulcatus*, VII. 73.

Cardinal teeth. [See Teeth.]

Carina, elevated. *U. pustulosus.* VIII. 73.

Carinate character of HELICES, uncertain. IV. 1.

" umbonial slope. *An. angulata.* II. 97. [See Umbonial slope, angular.]

Carocolla Cumberlandiana, resembles *Helix alternata.* III. 67.

Caruncle absent in *U. germanus.* XI. 54.

" or spongy mass on mantle of female UNIONES. *U. germanus*, XI. 54. XII. 87. *U. glans*, VII. 39, 40. X. 41. *U. parvus*, VII. 39, 40. X. 41, 76, 80. XI. 54. XII. 87. *U. paulus*, VII. 39, 40. X. 41. XI. 54.

Caruncle of *U. parvus*, contractile. VII. 39.

Castalia not among the TRIGONIANA. [Foot-note.] I. 204.

Cells of base membrane visible with a lens. *Mon. compressa.* XI. 35.

Cell structure, subhexahedral. *M. Connasaugaensis* and *U. gracilis.* VII. 48.

Changes in species. I. 2.

Character of teeth of certain South American UNIONES. XII. 84.

Characters of group embracing *Marg. Hildrethiana.* I. 149.

Characteristics of Central American UNIONES. XII. 27.

Chocolate colored nacre. *U. carbonarius*, II. 37. *U. retusus*, I. 87.

Cicatrices, anterior, confluent. *U. Ingallsianus.* V. 38.

" " separate in South American UNIONES. X. 17.

Cicatrices, anterior, three distinct. *U. Africanus*, VI. 21. *U. melleus*, VII. 68. *U. trossulus*, IV. 36.

Cicatrices, dorsal. I. 28, 29.

" " absent, imperceptible, or obsolete. *An. ensiformis*, V. 49. *An. latomarginata*, I. 188. *An. Schrŏteriana*, V. 49. *An. soleniformis*, V. 49. *An. tortilis*, V. 47. *An. Trautwiniana*, V. 43. *An. virens*, V. 47. *U. humilis*, VI. 16. *U. inornatus*, VI. 13.

Cicatrices, dorsal, location and direction. I. 28, 29.

" " long row of, *Triquetra contorta*, VI. 40. *U. Shuttleworthii*, VI. 25.

Cicatrices, dorsal, near the edge. *An. Linnæana*, V. 45.

Cicatrices, dorsal, row of. *Mon. rhomboidea*, VII. 81. *U. alatus*, I. 62, 63. *U. ater*, I. 40. *U. Brownii*, VI. 28. *U. firmus*, XII. 28. *U. Hainesianus*, VI. 9. *U. Heermannii*, IX. 17. *U. mutabilis*, VII. 66. *U. Ortonii*, XII. 82. *U. parvus*, IV. 35. *U. peculiaris*, XII. 26. *U. percoarctatus*, VIII. 63. *U. rudus*, VII. 84.

Cicatrices, dotted ventral. *U. Laosensis.* XI. 67.

" (Muscular attachments), number and location. I. 28, 29.

Cicatrices of muscles of foot of UNIONES. I. 4.

" remarkable. *An. Blainvilliana.* I. 190.

Cicatrix, dorsal, absent. *An. Schröteriana.* V. 49.

" of anterior tractor muscle; peculiar. *U. viridiradiatus.* VIII. 19.

Cicatrix of byssus. X. 46, 47. [See Byssus.]

" linear—of byssus. *U. rubellinus.* VI. 70.

" of extensor muscle of CASTALIA and HYRIA. I. 117. II. 109.

Cicatrix of ventral muscle. *U. Coloradoensis*, VI. 35. *U. Neusensis*, VIII. 65. *U. speciosus*, IX. 30. *U. trapezoides*, VI. 35. VIII. 65.

Cicatrix, palleal—remarkably indentated. *U. brevidens*, *compactus*, and *penitus.* VII. 35.

Cicatrix, posterior—deep and round. *U. tumescens.* IV. 45.

Cicatrix, posterior—of unusual form. *Triquetra contorta.* VI. 40.

Cicatrix, third anterior. *U. amygdalum*, IV. 35, 37. *U. cucumoides*, III. 31. IV. 35. *U. minor*, IV. 35, 36. *U. trossulus*, IV. 36.

Cicatrix, ventral. *U. Baldwinensis*, VIII. 12. *U. inusitatus*, VIII. 16. *U. salebrosus*, VIII. 15.

Cicatrix, ventral—imperfect. *U. Coloradoensis*, VI. 35. *U. trapezoides*, I. 80. V. 35.

Cicatrix, ventral—small. *U. errans*, VI. 61. *U. trapezoides*, I. 80.

Color and other peculiarities of soft parts of UNIONES. II. 53 to 57.

Coloring matter of epidermis marking lines of growth. *U. crebrivittatus.* XI. 47.

Color of nacre. I. 23.

Color of unexcluded embryos. VI. 44. [See Embryos.]

Columella and sinus of *Melania Duttoniana* like Io. III. 27.

Complanatus Group. *U. Abbevillensis*, VI. 52. X. 81. *U. aberrans*, XI. 11. *U. æquatus*, VI. 89. *U. angustatus*, I. 125. *U. Baldwinensis*, VIII. 12. *U. Beaverensis*, XII. 58. *U. Buddianus*, IV. 36. *U. Catawbensis*, VIII. 54. *U. confertus*, I. 226. *U. Congaræus*, I. 83. *U. Cuvierianus*, V. 20. *U. errans*, VI. 61. *U. exactus*, VIII. 66. *U. folliculatus*, II. 38. *U. fraternus*, V. 19. *U. fuliginosus*, IV. 52. *U. fumatus*, VI. 88. *U. Gastonensis*, XI. 25. *U. Gibbesianus*, V. 10. *U. Griffithianus*, I. 215. *U. Hallenbeckii*, VIII. 11. *U. hepaticus*, VIII. 30. *U. Hopetonensis*, II. 30. *U. humerosus*, XII. 61 [58]. *U. incrassatus*, III. 56. *U. indefinitus*, XI. 19. *U. inusitatis*, VIII. 16. *U. Jayensis*, II. 29. *U. jejunus*, II. 9. *U. latus*, VIII. 17. *U. Lazarus*, V. 15. *U. lugubris*, II. 31. *U. luridus*, V. 29. *U. macer*, IX. 25. *U. Mecklenburgensis*, XI. 22. *U. Mercerii*, IX. 32. *U. Neusensis*, VIII. 65. *U. Northamptonensis*, IX. 13. *U. obnubilus*, VI. 85. *U. occultus*, IV. 37. *U. opacus*, VI. 86. *U. percoarctatus*, VIII. 63. *U. Postellii*, VII. 33. *U. pullatus*, VI. 58. *U. pusillus*, III. 58. *U. quadratus*, VIII. 21. *U. Raleighensis*, XI. 11.

Complanatus group—
    U. Roanokensis, II. 27. *U. rostrum*, IX. 24. *U. Roswellensis*, VII. 24. *U. rufusculus*, V. 14. *U. Santéensis*, XIII. 25. *U. Savannahensis*, VI. 81. *U. sordidus*, V. 10. *U. Strebelii*, XII. 79. *U. strigosus*, III. 36. *U. subflavus*, VI. 90. *U. tortivus*, III. 42. *U. Tuomeyi*, X. 81. *U. vicinus*, VI. 62. *U. virens*, VI. 80. *U. viridicatus*, VI. 87. *U. viridiradiatus*, VIII. 19. *U. Weldonensis*, XI. 16. *U. Yadkinensis*, XIII. 37.
Composition of epidermis. I. 18.
Compressed form of *U. compressissimus*. IV. 55.
    " slender form of *An. exilis*. II. 82.
Concentric undulations on beaks. [See Beaks.]
    " wrinkles. *U. geometricus*. I. 151.
Confusion of European writers on American Melaniæ. IX. 91.
Conjectured form of oviducts of *U. dromas*. I. 183.
Connate behind the ligament. *U. ochraceus*. I. 69, 70.
    " characters—Divisions founded on. I. 78. [See Winged or Alate Uniones.]
Connate character of *An. cygnea*. I. 70.
Corrugated and furrowed disk of *U. Newcombianus*. VI. 33.
Corrugated, shrivelled surface of *U. diminutus*. VII. 72.
    " wrinkles of Uniones of Western Asia. XII. 11.
Costæ, divergent — characteristic of So. American Uniones. X. 24.
Crenulation of cardinal and lateral teeth of *Castalia*. I. 117. II. 109.
Crenulation of teeth of *U. Brownianus* and Hyria. II. 109.
Crimpled epidermis. *An. Holtonis*, VI. 37. *An. Schröteriana*, V. 49. *An. tortilis*, V. 47, 48. *Carocolla spinosa*, II. 69.
Crimpling, transverse—remarkable. *U. occatus*. X. 34.
Curvature of *Triquetra contorta*. VI. 41.
Curved furrow on posterior of *U. arcæformis*. I. 126.
    " row of tubercles. *U. Rumphianus*. V. 33.
Cut lip of *Anculosa incisa*. IV. 29.
    " " " *Melania excisa*, like Pleurotoma. IV. 26, 29.
Cylindrical form of An. gracilis. VII. 58.
Dark color of soft parts. *Marg. margaritifera*. VIII. 43.
Dark tinted epidermis. I. 26.
Deep color of nacre. *An. Burroughiana*. I. 218.
Definition of Unio. I. 6.
Dentate posterior margin of certain Uniones, II. 50; VII. 37. *U. arcæformis*, I. 127, 147; II. 50. *U. brevidens*, I. 198; II. 50. *U. capillaris*, I. 142; II. 50. *U. Haysianus*, I. 147, 148; VI. 75. *U. lenior*, III. 43. *U. Othcaloogaensis*, VI. 75. *U. sulcatus*, I. 45, 127, 147; II. 50.
Dentoid dorsal line of *An. grandis*. VII. 58.
    " " " peculiar to Anodontæ of Asia. VII. 58.
Different times of ovulation of *U. complanatus* and *radiatus*. X. 48.
Difficult identification of young *U. varicosus*. I. 100.
Dilatation of umbonial slope of *U. capsæformis*. I. 144.
Dimensions, measurement of Uniones. I. 6, 116.
Direction of movement of Uniones. I. 3.
Discharge of ova of *U. cylindricus*. (Dr. Kirtland.) III. 68.
Discharge of oviducts from *U. complanatus*. II. 52; III. 68.
Disk and beaks polished. *U. Whiteianus*. V. 15.
    " corrugated and furrowed. *U. Newcombianus*. VI. 33.
    " of female *U. Florentinus*, enlarged. VIII. 69.
Disks of Uniones of Lake Nicaragua, sulcate. XII. 52.
Distribution of *Lymnæa stagnalis*. IV. 8.
Distribution of *U. luteolus*. IX. 37.
Divergent costæ—characteristic of So. American Uniones. X. 24.
Divergent lines of epidermal matter in nacre of *An. tortilis*. V. 47.
Divergent rays, zigzag lines. I. 26, 55. [See Zigzag rays.]
Division of color of epidermis. *U. circulus*. I. 48.
    " " margin of disk in eight parts. I. 1.
    " " the family Naiades on connate characteristics. I. 78.
Division suggested in the Genus Melanopsis. I. 195.
Dorsal cicatrices. [Foot-note.] I. 40. [See Cicatrices.]
    " " location and direction. I. 28, 29, 40. [See Cicatrices.]
Dorsal muscles large and numerous. *U. lævissimus*. X. 61.
Dotted ventral cicatrices. *U. Laosensis*. XI. 67.
Double angle of posterior of *U. biangulatus*. III. 35.
    " row of tubercles of *Melania Jayana*. IV. 20.
    " lateral teeth in both valves, unusual. VII. 61. [See Teeth.]
Double winged shell of *U. Cumingii*. VII. 59.
Doubtfully plicate character of *An. tortilis*. V. 48.
Doubts, as to habitat of *An. Jewettii* and *Bridgesii*. XII. 52.
Dr. Kirtland on Sex of Uniones. II. 49.
Duplex form of wing of *U. delphinus*. III. 57.
Early examinations, soft parts, ova and embryos. II. 48 to 57.
Eggs of Valvata. IV. 22.
Elevated beaks of *U. pyramidatus*. I. 120.
Elevations, minute, granular, on *U. granosus*. I. 203.
    " on surface of disk. I. 24, 72.
Elleptical ova. *U. gibbosus*. X. 54.
Emarginate character of *Marg. margaritifera* and *U. emarginatus*, I. 175. *U. Conradicus*, I. 176.
Emarginate furrowed shell. *U. Verreauianus*. VI. 22.
    " palleal cicatrix. *U. compactus* and *Woodwardianus*. VII. 37.
Embryos [of Unionidæ], anterior and posterior margins equal. VI. 44.
    arrow-head points of. VI. 48, 49.
    attached by a filament. VI. 45.
    common form, in Anodonta. Subtriangular. VI. 46.
    common form in Margaritana. Subtriangular. VI. 46.
    common form in Unio. Pouch-shaped. VI. 46.
    elongate pouch-shaped. X. 42, 43, 47, 50, 69, 72.
    form of, as a specific test. *U. dolosus*. VIII. 80.

Embryos, forms of. VI. 44–50.
  groups of. VI. 44.
  hooks of. VI. 45, 46, 48, 49, 50. X. 39, 61, 72, 82, 84, 85, 86, 88, 89, 90. XII. 26. XIII. 73.
  inequilateral. *U. peculiaris.* XII. 26.
  measurements of. VI. 46.
  microscopic granules on surface. VI. 44.
  not analogous in form to the adult. VI. 44.
  numbers of, in *U. multiplicatus.* VII. 40.
  of ANODONTA and MARGARITANA, usually light-brown. VI. 44.
  of different colors from the same parent. X. 53.
  of So. American UNIONES, first described. XII. 28.
  of Unio, usually white. VI. 44.
  of unusual form. *U. Woodwardianus*, VI. 45, 47. *An. undulata*, VI. 46.
  ovate pouch-shaped. X. 39, 48, 55, 57, 62.
  pouch-shaped. [Species.] VI. 46, 47. X. 40, 41, 45, 55, 60, 63, 71, 78, 80. XIII. 72.
  pouch-shaped, narrow. XIII. 72, 73.
  " " wide, X. 45. XIII. 73.
  short pouch-shaped. X. 44, 54.
  subrotund, VI. 48, 49. X. 56, 78, 80. 83. XIII. 73.
  subtriangular, VI. 48, 49, 50. X. 59, 79, 84, 85, 86, 88, 89, 90. XIII. 73.
  triangular. X. 53, 86, 88, 90.
  unexcluded, color of. VI. 44.
  unimusculose character of. VI. 45.
  variable in color. *U. undulatus.* X. 53.
  wedge-shaped (with four hooks), *U. alatus*, VI. 45, 48; X. 39, 61, 70. *U. lævissimus*, VI. 45, 48; X. 61, 70. *U. purpuratus*, X. 61, 72; XIII. 73.
  wedge-shaped have two angles. VI. 45.
  with arrow-head points. VI. 48, 49.
  " converging rows of granules. VI. 48.
  " double line along the margin. VI. 45.
  " five rows of granules. VI. 49.
  " four interior spur-like processes. VI. 48.
  " " rows of granules. VI. 50.
  " granulate hooks. VI. 50.
  " several rows of granules. VI. 49.
  " two rows of granules. VI. 49.
  " " " " tubercles. VI. 48.
  " serrated hooks, VI. 45. XIII. 73.
  " unequal lateral margins. XII. 26.

Enlarged termination of lateral tooth. *U. oriens.* I. 78.
  " of disk of female *U. Florentinus.* VIII. 69.
  " of posterior of female UNIONES. II. 49, 50, 51. VIII. 69.

Epidermal colors and rays. I. 25, 26, 27.
  " laminæ, remarkable. *U. striatulus.* III. 41, 42.

Epidermal matter, divergent lines of, in nacre. *An. tortilis.* V. 47.

Epidermal matter in beaks. *An. tortilis*, V. 47. *Mon. lentiformis.* XII. 33.

Epidermal matter in nacre. *An. cylindracea*, II. 45. *U. cucumoides*, III. 31. *U. datus*, XII. 60. *U. rostrum*, IX. 24.

Epidermal matter in nacre, waved lines of. *An. exotica.* I. 206.

Epidermal spots in nacre. I. 74. *U. discrepans.* VIII. 23.

Epidermis, black, *U. corvunculus*, XII. 75. *U. funebralis*, X. 15. *U. nocturnus*, X. 17. *U. parvus*, XII. 75. *U. piceus*, X. 16.

Epidermis, composition of. I. 18.

Epidermis crimpled. *An. Schröteriana.* V. 49.
  " glossy. *Symph. lævissima*, I. 59. *Symph. ochracea*, I. 69.

Epidermis imbricate. *U. squalidus.* XI. 26.
  " like *U. anodontoides* and *cariosus.* *U. Floridensis.* V. 30.

Epidermis minutely crimpled or wrinkled. *An. crispata* and *tortilis*, V. 47, 48; VI. 33. *An. Holtonis*, VI. 36.

Epidermis minutely granulate. *U. cucumoides*, III. 57. *U. Poeyanus*, VI. 35.

Epidermis polished. *An. denigrata*, V. 41. *An. Dunlapiana*, III. 87. *An. exilior*, XIII. 28. *An. Gesnerii*, VII. 49. *An. globosa*, V. 45. *An. Henryana*, VIII. 55. *An. Leonensis*, XI. 26. *An. Moricandii*, X. 33. *An. Nuttalliana*, VI. 30. *An. virens*, V. 47. *Iridina cœlestis*, II. 82. *Marg. Alabamensis*, VIII. 108. *Marg. Gesnerii*, IX. 34. *U. Æsopus*, I. 27. *U. Africanus*, VI. 21. *U. amygdalum*, IV. 33. *U. Andersonensis*, XIII. 41. *U. approximus*, IV. 49. *U. Brumbyanus*, III. 83. *U. bulbosus*, VII. 10. *U. concavus*, V. 16. *U. corvus*, VII. 35. *U. curvatus*, XIII. 42. *U. cuspidatus*, XIII. 47. *U. differtus*, XIII. 46. *U. effulgens*, VI. 24. *U. excavatus*, VI. 71. *U. exiguus*, III. 29. *U. fulgidus*, IV. 47. *U. glaber*, II. 34. *U. gracilior*, VI. 57. *U. Higginsii*, IX. 10. *U. infulgens*, XIII. 64. *U. Jamesianus*, VI. 53. *U. Jeffreysianus*, XIII. 27. *U. Layardii*, VII. 61. *U. lepidior*, X. 26. *U. ligatus*, XIII. 53. *U. Lincecumii*, XII. 72. *U. lineatus*, III. 44. *U. luteus*, VI. 12. *U. luteolus*, II. 34. *U. micans*, VIII. 63. *U. Nuttallianus*, VI. 30. *U. obfuscus*, VII. 15. *U. oblatus*, XI. 17. *U. obuncus*, XIII. 13. *U. occultus*, IV. 37. *U. Othcaloogaensis*, VI. 75. *U. ovatus*, XII. 60. *U. parcus*, XII. 23. *U. penicillatus*, VII. 21. *U. perlucens*, XI. 23. *U. phaselus*, VI. 19. *U. pinguis*, VI. 78. *U. Prevostianus*, V. 25, 26. *U. pusillus*, III. 58. *U. radians*, VII. 20. *U. refulgens*, XII. 77. *U. rutilans*, VI. 59. *U. satur*, V. 22. *U. scobinatus*, VI. 19. *U. similis*, VI. 91. *U. subangulatus*, III. 47. *U. subellipsis*, VI. 62. *U. sudus*, VII. 12. *U. symmetricus*, IV. 47. *U. Tellicoensis*, XIII. 35. *U. Thwaitesii*, VII. 64. *U. Tigris*, XI. 66. *U. trossulus*, IV. 36. *U. umbrosus*, VI. 31. *U. Uruguayensis*, X. 25. *U. virescens*, VIII. 24. *U. viridulus*, XI. 15.

Epidermis, prolongation of. I. 18.
  " remarkable. *U. Chinensis*, XII. 86. *U. tenuissimus*, I. 68.

Epidermis remarkably smooth. *U. anodontoides.* I. 92.

Epidermis roughly striate. *An. Linnæana.* V. 45.
  " satin-like. *U. circulus*, I. 48. *U. disculus*, X. 22.

Epidermis smooth, shining. *U. obtusus.* III. 39.
" thick and black. *U. funebralis.* X. 15.
" thin and frail. *U. Granadensis.* XII. 54.
Erosions on ponderous shells. I. 27.
Error in definition of Genus Eurynea, *Agass.* X. 92.
Evidences of sexual differences among Uniones. II. 49.
Experiments relating to food of Uniones. I. 75.
Extensor muscle of foot, how attached. [Foot-note.] I. 77, 78.
External resemblance of *An. rotunda* and *U. quadrans.* VIII. 43.
Eyes on ends of papillæ. *U. radiatus*, X. 48. *An. imbecillis*, X. 85.
Females of *U. dolabræformis*, *lineatus*, *occidens*, *radiatus*, have black spots on border of mantle. II. 53. X. 50, 55.
Females of *U. radiatus* have variable forms of soft parts. II. 52, 53.
Female Uniones, remarks and notes on. *An. Strebelii*, XII. 83. *Marg. complanata*, X. 86. *Mon. Pazii*, XII. 34. *U. acutirostris*, XII. 30. *U. Bairdianus*, VIII. 44. *U. basalis*, XIII. 53. *U. biemarginatus*, XI. 52. *U. caliginosus*, IV. 54. *U. capsæformis*, II. 51, 95; VIII. 69. *U. cistellæformis*, XI. 24. *U. compactus*, VII. 37. *U. concestator*, VI. 67. *U. differtus*, XIII. 46. *U. difficilis*, XII. 72. *U. dispar*, VIII. 10. *U. dolabræformis*, II. 104; X. 55. *U. Downiei*, VII. 29. *U. excavatus*, VI. 72. *U. eximius*, VI. 15. *U. fallax*, VI. 80; VII. 26. *U. firmus*, XII. 28. *U. Florentinus*, VIII. 69. *U. foliatus*, V. 34; VIII. 69. *U. germanus*, XI. 54. *U. glans*, VII. 39, 40. *U. Haleianus*, V. 25. *U. Hazlehurstianus*, VII. 30. *U. Ingallsianus*, V. 38. *U. Jonesii*, VIII. 22. *U. lenior*, III. 43. *U. lineatus*, X. 50, 55. *U. medius*, VIII. 83. *U. metanever*, X. 66. *U. multiplicatus*, VII. 9. *U. Nashvillianus*, V. 25. *U. Newcombianus*, VI. 33. *U. nigerrimus*, V. 25. *U. obnubilus*, VI. 85. *U. occidens*, II. 104. *U. Othcaloogaensis*, VI. 75. *U. ovatus*, X. 71. *U. parvus*, V. 25; VII. 39; X. 39. *U. paulus*, VII. 39; X. 39. *U. peculiaris*, XII. 26. *U. perplexus*, II. 51, 95; IV. 15; X. 56. *U. phaseolus*, II. 51. *U. Powellii*, V. 27. *U. Prattii*, VII. 26. *U. propinquus*, VIII. 68. *U. radiatus*, II. 53. X. 50, 55. *U. Rangianus*, II. 95; VIII. 68. IX. 15. *U. Reeveianus*, V. 28. *U. rostellum*, XIII. 48. *U. Rutersvillensis*, VIII. 33. *U. Sampsonii.* IX. 15. *U. scitulus*, VIII. 25. *U. Spillmanii*, VIII. 103. *U. splendidus*, X. 50. *U. Stewardsonii*, V. 34; VIII. 69. *U. subniger*, VII. 15. *U. sudus*, VII. 13. *U. sulcatus*, X. 79. *U. Topekaensis*, XII. 74. *U. ventricosus*, VII. 42. *U. vesicularis*, XIII. 42.
Female Uniones with dentate posterior margins. [See Dentate, etc.]
Ferussac's divisions of the family Naiades. II. 117.
Festoon-like wrinkles. *An. Napoensis.* XII. 85.
First description of soft parts of South American Uniones. XII. 28.
Flesh-red interior of shell. *U. sulcatus.* I. 45.
Fleshy flaps of mantle. *U. perplexus*, female. X. 56.
" mass on mantle of *U. penitus.* X. 76.
" process of mantle. *U. lineatus.* X. 43.
" process of *U. luteolus* like that of *radiatus.* X. 38.
Florida Uniones. IV. 33.
Folded branchial uterus. X. 79, 80.
" ovisacks. X. 79, 80.
" Uniones. [See Undulate Uniones.]
" Uniones in the Chattahoochee River. III. 46.
" Uniones regarded as Western. III. 46.
Folds, divergent; beaks of South American Uniones. XII. 24.
Folds forming an acute angle, umbonial slope of *U. Murchisonianus.* I. 146.
Folds nearly parallel with base of shell. *U. Neislerii.* VII. 31.
Folds, numerous small on posterior slope. *U. pliciferus.* II. 62.
Folds on umbo of Hyria. I. 204.
" or plications, how formed. I. 74.
" remarkable. *U. Neislerii*, VII. 31. *U. plicatulus*, VII. 65.
Folds visible within the shell. *U. atro-marginatus*, III. 45. *U. diminutus*, VII. 33. *U. scobinatus*, VI. 20.
Folds, zigzag lines. *U. Shurtleffianus.* VI. 23.
Foot of *Marg. margaritifera* dark colored. VII. 43.
" *U. rubiginosus* remarkably triangular. X. 52.
Form of soft parts indicated by the shell. I. 19.
" tubercles peculiar. *U. lachrymosus.* I. 15.
Forms of valves not constant. I. 28.
Fossett. [See Triangular Fosset and Triangular Sinus.]
" at end of ligament. *An. Linnæana.* V. 46.
" triangular, of South American Anodontæ. *A. Holtonis*, VI. 37. *A. Linnæana*, V. 46. *A. luteola*, VII. 86. *A. obtusa*, VII. 86. *A. Schröteriana*, V. 49. *A. tortilis*, V. 48. *A. Trautwiniana*, V. 43, 44, 48. *A. Wheatleyi*, V. 44.
Fragile shell. *U. tenuissimus.* I. 68.
Fringe of mantle. *U. radiatus.* X. 48.
Furrowed shells. *Marg. Curreyiana*, III. 61. *U. asper*, I. 96. *U. Edgarianus*, III. 53. *U. effulgens*, VI. 24. *U. Haysianus*, I. 148. *U. pileus*, I. 130. *U. sulcatus*, I. 25, 45. *U. Verreauianus*, VI. 22.
Furrowed surface. *U. aratus.* IV. 40.
Furrow, oblique. *U. propinquus.* VIII. 68.
Furrows of *Helicina virginea.* I. 162.
Gamboge yellow nacre. *U. Camelopardilis*, VIII. 38. *U. Elliottii*, VI. 56.
General form and modifications of forms of Uniones. I. 28.
Geographical distribution. III. 46.
" " of *Marg. margaritifera.* VII. 43; XI. 67.
Geological strata identified by shells. I. Introduction.
Gestation of Uniones. III. 70.
Gigantic specimen of *U. Cumingii.* XII. 45, 46.
Golden nacre. *U. Elliottii*, VI. 55. *U. Gouldii*, IV. 50.
Golden tint of nacre. *U. aureus*, IX. 18. *U. dromas*, VI. 55.

Granular elevations, minute. *U. granosus.* I. 203.
Granulations, minute, in cavity of *Mon. Mardinensis.* XII. 13.
Granulations, minute. *U. delphinus.* III. 56.
Granules, line of, on umbonial slope of *U. phaselus.* VI. 18.
Granules, microscopic, visible on mature shells. *An. fragilis* and *fluviatilis*, and *U. ochraceus*, X. 91.
Granules, minute, in epidermis of *U. Popei.* VI. 36.
“ visible in shells of *An. tortilis.* V. 48.
Great group of folded UNIONES. VI. 55. [See Plicate Uniones.]
Great Slave Lake. *U. luteolus.* IX. 36.
“ width of basal margin. *U. funebralis.* X. 15.
Green, irregular spots, not a specific test for UNIONES. I. 24.
Green, irregular spots of epidermal matter in nacre. I. 74.
Green spot, single, on *U. Lewisii.* VIII. 75.
“ spots of *U. Camelopardilis*, VIII. 37. *U. fucatus*, VIII. 35.
Green, spotted lines, *U. irroratus.* I. 26.
Groove on middle of valve. *U. Rumphianus.* V. 33.
Grooves on posterior slope of *U. metanever*, *tuberosus*, and *sparsus.* V. 33.
Grooves in UNIONES, adapted to enlarged ovisacks. II. 51.
Group of *An. Ferussaciana.* — *A. pavonia*, II. 79. *A. subcylindracea*, II. 106.
Group of *An. rotunda.—A. Cailliaudii*, X. 31.
“ “ ANODONTÆ with callus on dorsal margin. V. 49. [See Incipient teeth, or Rudimentary teeth.]
Group of ANODONTÆ with dentoid dorsal line. VII. 58.
“ “ forms of Embryos. VI. 44.
“ “ HELICES with apertures alike. II. 108.
“ “ small shells. *U. corvinus.* XII. 71.
“ “ species with a row of spots before the umbonial slope. VIII. 88.
Group of sulcate UNIONES. *U. scamnatus* and *Verreauianus.* VI. 22.
Group of symphynote UNIONES. *U. Housei.* VI. 11.
“ “ *Uniones acutissimus*, *Conradicus*, *parvulus*, etc. XII. 49.
“ “ “ *caperatus*, *dromas*, *irroratus*, etc. V. 23.
“ “ “ *capsæformis*, *biemarginatus*, *Florentinus*, etc. VIII. 67.
“ “ “ *consobrinus*, *Layardii*, *lamellatus*, and *marginalis.* VII. 91.
“ “ “ *crispatus*, *gratiosus*, *humilis*, *phaselus*, etc. VI. 17.
“ “ “ *doliaris*, *multiradiatus*, *perovalis*, etc. XII. 21.
“ “ “ having folded Branchial uterus. X. 80.
“ “ “ having immature hinge. *U. Conradicus.* I. 176.
“ “ “ *Hildrethianus*, *oriens* and *soleniformis.* I. 149.
“ “ “ with interrupted rays. *U. pictus.* I. 186.
“ “ *U. acutissimus.* — *penicillatus.* VII. 22.
Group of *U. angustatus.* — *naviculoides.* VI. 95.
“ “ “ *atratus.* — *lepidior.* X. 26.
“ “ “ *Brumbyanus.* — *concolor.* VIII. 93.
“ “ “ *cærulescens.* — *evitatus.* XII. 39.
“ “ “ *camptodon.* — *symmetricus*, IV. 48. — *Jamesianus*, VI. 53.
“ “ “ *castaneus.* — *Genthii.* VIII. 62.
“ “ “ *cariosus.* — *affinis*, V. 27. — *Powellii*, V. 26. — *virescens*, VIII. 24.
“ “ “ *clavus.* — *Chattanoogaensis*, VII. 28. — *Lesleyi*, VIII. 34. — *mundus*, X. 44.
“ “ “ *crassidens.* — *gibber*, II. 35. — *inornatus*, III. 56. — *Lecontianus*, II. 40.
“ “ “ *crassus.* — *pulcher.* II. 6.
“ “ “ *delodontus.* — *piger*, X. 24. — *Uruguayensis.* X. 25.
“ “ “ *dolabelloides.* — *Thorntonii.* XI. 42.
“ “ “ *fallax.* — *intercedens.* VI. 77.
“ “ “ *Geddingsianus.* — *similis.* VI. 91.
“ “ “ *gibbosus.* — *arctior*, II. 10. — *subgibbosus*, VI. 54.
“ “ “ *gratiosus.* — *scobinatus*, VI. 19.
“ “ “ *Hanleyianus.* — *flavidulus.* VIII. 101.
“ “ “ *interruptus.* — *punctatus.* XII. 22.
“ “ “ *iris.* — *Cumberlandianus*, II. 25. — *glaber*, II. 34. — *Muhlfeldianus*, II. 41. — *Novi-Eboraci*, II. 105.
“ “ “ *irroratus.* — *grandidens.* IX. 28.
“ “ “ *Lecontianus.* — *geminus*, VI. 64. — *Satillaensis*, VII. 35.
“ “ “ *ligamentinus.* — *Menkianus*, II. 76. — *pulcher*, II. 6. — *pinguis*, VI. 78. — *venustus*, II. 4.
“ “ “ *luteolus.* — *Claibornensis*, II. 106. — *Hydeianus*, II. 15. — *Wymanii*, X. 18.
“ “ “ *multiplicatus.* — *Eightsii.* VIII. 50.
“ “ “ *multiradiatus.* — *perradiatus.* VIII. 70.
“ “ “ *Murchisonianus.* — *Wrightii.* XII. 45.
“ “ “ *Nashvillianus.* — *contiguus*, IX. 22. — *fallax*, VI. 80. — *nigerrimus*, V. 25.
“ “ “ *nasutus.* — *Emmonsii*, VIII. 61; X. 81. *Fisherianus*, II. 8. — *sagittiformis*, V. 34. — *Vaughanianus*, II. 5.
“ “ “ *negatus.* — *planior.* XII. 77.
“ “ “ *nitens.* — *tenebricus.* VI. 83.
“ “ “ *obesus.* — *Bisselianus*, XII. 38. — *Columbensis*, VI. 75. — *squalidus*, XI. 26.
“ “ “ *occidens.* — *lineatus.* III. 45.
“ “ “ *ochraceus.* — *splendidus.* II. 71.
“ “ “ *ovatus.* — *dolabræformis*, II. 103. — *excavatus*, VI. 72. — *satur*, V. 22.
“ “ “ *Paranensis.* — *funebralis*, X. 15. — *nocturnus*, X. 17.
“ “ “ *parvus.* — *Bealei*, IX. 27. — *corvunculus*, XII. 75. — *Cromwellii*, XII. 19. — *marginis*, XII. 15.
“ “ “ *perplexus.* — *propinquus.* VIII. 68.
“ “ “ *pictus.* — *Lindsleyi.* VIII. 33.
“ “ “ *pustulosus.* — *asperatus*, VIII, 73. — *Kienerianus*, V. 37.
“ “ “ *radiatus* and *luteolus* — *Hydeianus.* I. 14.
“ “ “ *Savannahensis.* — *curatus.* XI. 27.

Group of *U. solidus.* — *Hartmanianus.* VIII. 77.
" " " *Stewardsonii.* — *biemarginatus.* XI. 52.
" " " *tetricus.* — *purpurellus.* VII. 17.
" " " *trigonus.* — *Riddellii.* IX. 21.
" " " *tumidulus.* — *Pazii.* XI. 66.
" " " *verrucosus.* — *Cooperianus* and *graniferus.* II. 70.
Habits and anatomy of ANCULOSA. IV. 14.
" of *Anodonta ovata.* X. 89.
" of *Marg. dehiscens* (*U. oriens*). I. 117; X. 72; XII. 36.
Habits of UNIONES—erroneous ideas in Europe in relation to. I. 136.
Habits of UNIONES little known. I. 3.
Hair-like lines or rays of *U. sulcatus*, I. 25, 45. *U. persulcatus*, VII. 73.
Hair-like rays of *U. perpurpureus.* XI. 51.
" spotted rays. *U. compactus.* VII. 36.
Helix Californiensis, remarkably globose. II. 99.
" *Columbiana*, resembles thyroides. II. 89.
" *magnifica*, resembles *pellis-serpentis.* II. 90.
" *Nickliniana* resembles *Californiensis.* II. 100.
" *Vancouverensis* resembles *concava.* II. 88.
Hermaphrodite or bi-sexual character of UNIONES. I. 3.
Hinges of UNIONES, not a reliable generic test. I. 77.
" remarkable. *U. heterodon.* I. 43.
Holes at lower end of ovisack. *U. Claibornensis.* X. 72.
Hollow spines and process of mantle. *U. spinosus.* X. 49.
Hook or spur of embryos triangular at base. VI. 45. [See Embryos.]
Hooks of embryos. XIII. 73. [See Embryos.]
" serrated, of embryos. VI. 45. [See Embryos.]
Horn-colored border. *An. latomarginata*, I. 188. *An. tenebricosa*, I. 188, 189, 191.
Horn-colored HELICES of the United States. IV. 1.
Horns of *U. cornutus.* I. 24, 25, 73; II. 59.
Identification of Lamarck's species. I. 35.
Imperfect or anomalous teeth. *U. soleniformis.* I. 98, 99.
Imperfect teeth of *U. cucumoides.* III. 31.
Incipient lateral tooth. *Marg. rugosa.* I. 77.
" tooth. *An. areolata*, I. 77. *An. Blainvilliana*, I. 189. *An. Ferussaciana*, I. 157. *An. pavonia*, II. 79.
Incipient tooth of young Anodonta. *A. Texasensis.* VIII. 49.
Incipient teeth. [See Rudimentary teeth and Callus on dorsal margin.]
Indented line below great posterior cicatrix. *U. brevidens*, *compactus*, *penitus.* VII. 36, 37.
Indistinct capillary rays. *An. Couperiana.* III. 65.
" tubercles of *U. Schoolcraftii.* I. 150.
Inequivalve character of *An. tenebricosa.* I. 191.
" shells of Lake Nicaragua. XII. 57.
" species. *An. Granadensis*, XII. 48. *An. inæquivalva*, XII. 53. *An. lenticularis*, XII. 50. *An. tenebricosa*, I. 191. *Spatha Natalensis* and *rubens*, XI. 69. *U. encarpus*, XII. 54. *U. Gabbianus*, XII. 55. *U. Newcombianus*, XII. 57. *U. Nicaraguensis*, XII. 56. *U. tortuosus*, XII. 46.
Inflated shell. *Marg. arcula.* II. 72.
Interior of shell waved by outer tubercles. *U. Forsheyi.* VIII. 40.
Interior surface irregularly waving. *U. trinacris.* VIII. 91.
Interrupted indistinct rays. *U. brevidens.* I. 86.
" ray, large. *U. pustulosus.* I. 87.
" rays, *U. acuens*, XIII. 32. *U. bellulus*, XIII. 54. *U. flavidus*, XIII. 33. *U. interruptus*, II. 16. *U. Lamarckianus*, V. 23. *U. patulus*, I. 26. *U. perdix*, I. 185. *U. pictus*, I. 186. *U. planulatus*, I. 26. *U. scalenius*, I. 26. *U. verrucosus*, I. 26.
Io, believed to be marine shells. I. 225.
" observed in ancient graves. I. 224.
Irregular nodes of *U. perplexus.* I. 124.
Lamarck and Barnes on *U. alatus* as a generic type. I. 57.
Lamellar teeth. [See Teeth.]
Lamellar teeth of *U. lamellatus.* II. 19.
Large area of valve. *An. gigantea.* II. 2.
Largest TRYPANOSTOMA. IX. 106.
Lateral teeth. [See Teeth.]
Lenticular form of *U. lentiformis.* XII. 33.
Ligament, variable form of. I. 29.
Light-colored margin, remarkable. *Physa elliptica.* I. 227.
Light—sensitive to. *An. imbecillis*, *U. cylindricus*, *U. radiatus*, *U. rubiginosus*, VI. Introduction and 51. *An. imbecellis*, X. 86. *U. pustulosus*, X. 64. *U. pyramidatus*, X. 69.
Line, elevated, on posterior slope of *U. Nicklinianus.* III. 72.
Line of granules, umbonial slope of *U. phaselus.* VI. 18.
Lines, minute capillary. *U. Camelopardilis.* VIII. 37.
" minute, spotted. *U. irroratus.* I. 12.
" obscure, raised, on So. American UNIONES. X. 19.
Lips or tentacles. (Palpi.) VI. 55.
Liver greenish in most UNIONES—yellow in *U. camptodon.* X. 52.
Liver, process from, like a style. *U. perplexus.* X. 56.
Locality of *U. superbus*—River Souzi. IV. 39.
Location and direction of dorsal cicatrices. I. 28, 29.
Longitudinal furrows on teeth of CASTALIA. I. 57.
Lunule, anterior, wide. *Plagiodon isocardioides*, VI. 39. *U. pinguis*, VI. 78.
Lunule in *U. gravidus.* VI. 13.
Longitudinal callus on dorsal line. *An. Senegalensis.* VII. 78.
Maculations absent on mantle of *Marg. confragosa.* X. 84.
Maculations, brownish—of MARGARITANA. X. 76, 84.
" on mantle, characteristic of MARGARITANA. VIII. 112.
Maculate rays. *U. planior.* XII. 77. [See Interrupted rays.]
Maculations, short capillary lines. *U. ornatus.* VIII. 90.
Male and female UNIONES. II. 51, 52, 53, 54, 55. [See Female Uniones.]
Male of *U. rubellinus.* VI. 71.

Mantle attached to cavity of shell. *Marg. margaritifera.* VII. 43.
Mantle blackish, syphon brownish. *An. Lewisii.* VIII. 45.
Mantle black on margin. *U. Conradicus.* X. 46.
" crenulate and has a callus. *U. Othcaloogaensis.* VI. 74.
Mantle double at edges. *An. Henryana.* VIII. 55.
" emarginate posteriorly. *U. rostriformis.* VI. 64.
Mantle enlarged into a flap. *U. Rangianus.* X. 62.
" —fleshy border with black spots. *U. dolabræformis, lineatus, occidens* and *radiatus.* II. 53; X. 50, 55.
Mantle—fleshy enlargement, hard. *U. triangularis.* X. 57.
Mantle maculate, brown on posterior edges. *Marg. Elliottii.* VII. 44.
Mantle maculate on posterior edges. *An. Showalterii.* IX. 37.
Mantle maculate—square, brown spots. *Marg. triangulata.* VII. 46.
Mantle maculate. *U. fabalis,* X. 59. *U. penitus,* X. 76. *U. triangularis,* X. 56.
Mantle maculate, variably. *U. irroratus.* X. 70.
" margined with a black line. *U. Showalterii.* VIII. 78.
Mantle, margin singularly enlarged. *U. compactus.* X. 80.
Mantle obtusely angular before. *U. inusitatis.* VIII. 16.
Mantle of *U. radiatus,* variable forms of. II. 52.
" peculiar. *U. denigratus,* VII. 19. *U. fallax,* VI. 79. *U. stramineus,* VII. 41. *U. ventricosus,* VII. 42.
Mantle thickened, doubled, colored. *U. Columbensis,* VI. 75. *U. intercedens,* VI. 77.
Mantle with a pecular process. *U. ventricosus.* VII. 42.
" " black border. *U. Goascoranensis.* VII. 77.
" " " spot. *U. Claibornensis.* X. 72.
" " broad border, dark line running to maculations. VIII. 112.
Mantle with fleshy flap. *U. perplexus.* X. 56. [See *Rangianus.* X. 62.]
Mantle with fringed ocellate process. *An. Showalterii,* IX. 37. *U. lineatus,* X. 43. *U. radiatus,* II. 53. X. 43.
Mantle with quadrate spots. *Marg. arcula.* X. 83.
" " subquadrate spots. *Marg. marginata.* X. 82.
Mantle with square spots on edge. *Marg. Elliottii.* VII. 44.
Mantle with thin edges and blackish spots. *Marg. elliptica.* VIII. 111.
Mantle with very broad border. *U. rubidus.* VIII. 100.
Mantle with very large margin. *U. fraternus.* X. 46.
MARGARITANA, allied—
  M. Alabamensis allied to *Spillmanii.* VIII. 109.
  M. elliptica allied to *Elliottii.* VIII. 111.
  M. Georgiana analogous to *Holstonia.* VII. 45.
  M. Holstonia allied to *Raveneliana.* II. 42.
MARGARITANA, allied—
  M. minor allied to *deltoidea.* IV. 57.
  M. Raveneliana resembles *marginata.* I. 219.
  M. triangulata allied to *undulata.* VII. 47.
Margaritana complanata in Lake Winnipeg. IX. 37.
Marg. margaritifera in Columbia River. II. 97, 98.
Margin, dentate. [See Dentate posterior margin.]
" remarkably broad. *U. atromarginatus.* III. 45.
Mark, yellow, behind beak of *U. ebenus.* I. 95.
Measurements and weights of large shells. I. 116.
Melania classed by exterior forms. III. 1.
" *nobilis* allied to the genus Io. IV. 65.
Microscopic granules visible on mature shells. *An. fluviatilis* and *fragilis.* X. 91.
Minute granulations in cavity of *Mon. Mardinensis.* XII. 13.
Minute rays. *U. multiradiatus.* I. 49.
Monocondylæa rhomboidea, a new type. VII. 81, 82.
Mottled papillæ, syphon of *U. ventricosus.* VII. 42.
Muscle, posterior adductor, enormously large. *U. triangularis.* X. 57.
Muscle, posterior, of foot. I. 28.
" superior anterior tractor. *U. Myersii.* VI. 10.
Muscles, adductor. I. 28.
" " large. *Marg. margaritifera,* VII. 43. *U. lævissimus,* X. 61.
Muscles and muscular impressions in cavity of beaks. I. 4.
Muscles, anterior tractor, large. *U. lævissimus.* X. 61.
" dorsal, large and numerous. *U. lævissimus.* X. 61.
Muscles for locomotion. I. 28.
" supporting foot, distinct from adductors. I. 4.
Muscles, tractor, large. *Marg. margaritifera.* VII. 43.
Muscles, two pairs for locomotion. I. 28.
Muscular impressions important, but not reliable as specific tests. I. 28.
MYTILACEA attached by a byssus. I. 19.
Nacre almost varicose. *U. compressissimus.* IV. 55.
" brilliant. *An. Cailliaudii.* X. 31.
" chocolate colored. *U. retusus.* I. 87.
" color of, referring to species. I. 23, 24, 87, 115.
" gamboge yellow. *U. Camelopardilis,* VIII. 38. *U. Elliottii,* VI. 56.
Nacre, golden tint. *Monocond. Wheatleyi,* XII. 12. *U. dromas* and *U. Elliottii,* VI. 55. *U. Emasaensis,* XII. 14. *U. Mardinensis,* XII. 12.
Nacre in beaks of *An. tortilis* stained with epidermal matter. V. 47.
Nacre minutely striate from beak to margin. *An. Trautwiniana.* V. 43.
Nacre not a reliable specific test. I. 24.
" of So. American ANODONTÆ with black pencilled marks. *An. Schröteriana.* V. 49.
Nacre pearly and white. Species having. I. 23.
" purple. *Marg. margaritifera.* II. 98.
" remarkable. *U. cinnamomicus,* VIII. 105. *U. Heermanii,* IX. 17. *U. refulgens,* XII. 78.
Nacre remarkably red. *An. Pazii.* XII. 35.
" " white. *U. rugososulcatus.* XII. 27.

Nacre satin-like. *An. Wheatleyiana*, V. 44. *Mon. Wheatleyi*, X. 36. *U. Aferulus*, XI. 39. *U. circulus*, I. 48. *U. litus*, XIII. 21. *U. Mardinensis*, XII. 12. *U. Natalensis*, XI. 64. *U. obfuscus*, VII. 16. *U. occatus*, X. 34. *U. Pazii*, XI. 66. *U. Tappanianus*, II. 63.

Nacre spotted with epidermal matter. *An. Forbesiana*, X. 29.

Nacre unlike in two valves of an ANODONTA. I. 24.

" variation in color. I. 87.

Narrow pouch-shaped embryos. XIII. 72, 73. [See Embryo.]

NERITINA in Southern rivers. IX. 89.

New type. *Mon. rhomboidea.* VII. 81, 82.

Nodular ridge of *U. Æsopus.* I. 25.

Nodulous Uniones. [See Tuberculate and Nodulous Uniones.]

No opening at end of abdominal sack. [Foot-note.] VIII. 52.

Notes and corrections. *U. Douglasiæ.* XII. 43, 44.

Numerous folds of *Melania plicifera.* II. 93.

" small folds on posterior slope of *U. pliciferus.* II. 62.

Oblique carina from beaks to posterior margin. *U. donaciformis.* I. 9.

Obscure character of teeth of *U. creperus.* II. 33.

Obtuse apex. *Paludina obtusa.* IV. 13. [*Bythinella obtusa.*]

Ocellate process of mantle, like *U. radiatus.* (*U. lineatus.*) X. 43. [See II. 53.]

Offsetting posterior point of branchiæ. *Marg. margaritifera* and *U. monodontus.* X. 58.

Opening, none at end of abdominal sack. [Foot-note.] VIII. 52.

Opening, none, to interior leaf of branchiæ. *U. tenerus*, X. 51.

Opercle of the Genus MELANIA. I. 194.

" remarkable. ANCULOSÆ of Coosa River. IX. 43.

Opercle, serrated. *Lithasia fusiformis.* IX. 84.

" spiral. AMNICOLA. IX. 38.

Opinions of naturalists on genera and species. I. 2, 20.

Orange-colored soft parts. *Trypanostoma Hartmanii.* IX. 92.

Organization of UNIONES, perfection of. I. 2.

" peculiar. *U. irroratus.* I. 12.

Ornate character of *U. apiculatus.* IX. 30.

Outline, remarkable. *U. Paranensis.* I. 212.

Ova and oviducts. Notes on species. [1834–6.] II. 53, 54, 55, 56, 57. [1838–40.] III. 69.

Ova, bright-red. X. 52, 64, 68.

Ova, discharge of—Dr. KIRTLAND on. III. 68.

" elliptical. *U. gibbosus.* X. 54.

" of UNIONES, tabular notes on. III. 69.

Ovarium, the largest portion of the body. III. 71.

Ova usually globular. X. 54.

" vitellus of, yellowish. *U. camptodon.* X. 52.

Oviducts arranged in the form of a depressed cone. *U. irroratus.* I. 13.

Oviducts of ANODONTÆ, not divided in sacks. II. 51.

" of *U. dromas*—conjectured form of. I. 183.

Oviducts peculiarly arranged. *An. edentula.* II. 52.

" peculiar. *U. irroratus*, I. 5, 13; II. 51. *U. phaseolus*, II. 51.

Oviducts sacciform. *U. complanatus.* II. 52.

" in both pairs of branchiæ. III. 71.

" in posterior portion of branchiæ. II. 49.

Ovo-viviparous character of ANODONTÆ. III. 68.

Ovum of *U. subangulatus.* VI. 50.

Ovisack, an elongated cone. *U. phaseolus.* VII. 38.

Ovisacks, about twelve in *U. lineatus.* X. 43.

" appearance and position remarkable. *U. cornutus.* X. 65.

Ovisacks, arrangement extraordinary. II. 11; X. 70.

" black on end. *U. stramineus.* VII. 41.

" club-shaped. *U. Woodwardianus.* VII. 18.

" coarse, thick lobed (like *cariosus*). *U. anodontoides.* X. 42.

Ovisacks, cylindrical. *U. parvus.* VII. 39.

" excluded whole. [Foot-note.] VI. 44.

" inserted half-way up leaf of branchia, pendent. *U. subangulatus.* X. 44.

Ovisacks large, dark border below. *U. tenerus.* X. 51.

" large, numerous (17 to 30). *U. subangulatus.* X. 44.

Ovisacks long, narrow, pointed at both ends. *U. rubiginosus.* X. 52.

Ovisacks long. *U. Barrattii*, X. 44. *U. nigellus.* X. 45.

Ovisacks numerous, forming 38 folds. *U. phaseolus.* VII. 38.

Ovisacks of *U. acutissimus* and *parvulus* differ. XI. 50.

" of *U. paulus* (10), like *heterodon.* X. 38. [See II. 56.]

Ovisacks peculiar (12 to 15). *U. fallax*, VI. 79. *U. penicillatus* (20), VII. 21. *U. spinosus*, X. 49. *U. Woodwardianus*, VII. 18.

Ovisacks rose-red. *U. rubiginosus.* X. 53.

" transverse. *An. edentula*, X. 89. *An. undulata*, X. 86, 89.

Ovisacks very large, subovate, blackish below. *U. radiatus.* X. 48.

Ovisacks very large. *U. ligamentinus.* X. 60.

" with terminal red spot. *U. phaseolus.* VII. 38.

Ovisacks, 5 or 6. *U. penicillatus.* [Foot-note.] VII. 21.

Ovisacks, 7 or 8, pendent. *U. irroratus.* X. 69. [See II. 11.]

Ovisacks, 12 on a side. *U. parvus*, VII. 39. *U. purpuratus*, X. 72.

Ovisacks, 13 on a side. *U. stramineus.* VII. 41.

" 15. *rutilans.* VI. 60.

" 15 to 20, like *cariosus.* *U. dolabræformis.* X. 49.

Ovisacks, 15 to 20. *U. Novi-Eboraci.* X. 55.

Ovisacks, 16 in each outer branchia. *U. gracillior*, VI. 56. *U. tenerus*, X. 51.

Ovisacks, 18 on a side. *U. radiatus.* X. 48.

" 20, like *cariosus.* *U. ovatus.* X. 71.

" 25 on each side, like *cariosus.* *U. retusus.* X. 69.

Ovisacks, 28 on each side, like *cariosus.* *U. excavatus.* VI. 72.

Ovisacks, 30 in each leaf of branchia. *U. alatus.* X. 39.
Ovisacks, 40 in each outer branchia. *U. luteolus.* X. 38.
" 40 on each side. *U. ligamentinus.* X. 60.
Palleal cicatrices remarkably indentated—(emarginate.) *U. brevidens, compactus,* and *penitus.* VII. 37. *U. propinquus.* VIII. 68.
Palleal cicatrix, position of, remarkable. *U. Cumingii.* VII. 60.
Palpi, lips or tentacles. VI. 55.
" long and pointed. *U. Boykinianus.* X. 39.
" remarkable. *An. Wahlamatensis.* X. 90.
" round. *An. latomarginata.* X. 30. *A. Wymanii.* X. 27, 30.
Palpi rounded, peculiar to South American species. XII. 31.
Papillæ absent on anal opening, not a generic test. X. 83.
Papillæ absent on anal opening, group of Unionesshowing. X. 68.
Papillæ absent on anal opening (referring to species so characterized). *An. Dariensis,* VII. 49. *An. decora,* X. 88. *An. gigantea,* X. 90. *An. imbecillis,* X. 86. *An. Kennerlyi,* VIII. 13. *An. lacustris,* VIII. 46. *An. latomarginata,* X. 30. *An. plana,* X. 88. *An. Wymanii,* X. 27. *Marg. dehiscens,* X. 76. *Marg. Hildrethiana,* X. 83. *Marg. margaritifera,* VII. 43. *Marg. marginata,* X. 82, 83. *Marg. rugosa,* X. 82, 83. *M. triangulata,* VII. 46. *Mon. Pazii,* XII. 34. *U. asper,* X. 73. *U. Blandianus,* V. 66. *U. cylindricus,* X. 57. *U. declivis.* X. 74. *U. Forsheyi,* VIII. 40. *U. Houstonensis,* VIII. 41. *U. infucatus,* X. 43. *U. irroratus,* X. 70. *U. Kleinianus,* X. 40. *U. lachrymosus,* X. 67. *U. ligamentinus,* X. 60. *U. metanever,* X. 66. *U. multiradiatus,* X. 62. *U. phaseolus,* VII. 38. *U. pressus,* X. 59. *U. rectus,* X. 63. *U. retusus,* X. 69. *U. securis,* X. 68. *U. triangularis,* X. 57. *U. verrucosus,* X. 63.
Papillæ branching. *M. margaritifera,* VII. 43; X. 63. *U. subrotundus,* X. 63.
Papillæ forming a fringe. *U. sudus.* VII. 13.
" knob-like. *Mon. Pazii.* XII. 34.
" mottled, anal and branchial opening of *U. ventricosus.* VII. 42.
Papillæ of branchial opening peculiarly arranged. *U. subangulatus.* X. 44.
Papillæ of mantle larger in female. *U. multiradiatus,* X. 62. *U. rectus,* X. 63.
Papillæ of mantle like fishes' teeth. *U. stramineus.* VII. 41.
Parasite—nidus of. [Foot-note to *U. ellipsis.*] VI. 63.
Parturition, mode of. *An. edentula.* X. 86.
Pearls, small, irregular in cavity of *U. umbrosus.* VI. 32; XII. 87.
Peculiar anal opening. *U. stramineus.* VII. 41.
Peculiar process extending from mantle. *U. ventricosus.* VII. 42.
Perforating habits of Mycetopus. XII. 36.
Pigmentum nigrum, mantle of *U. cylindricus.* X. 64.
Pink teeth. [See Teeth.]
Plicate character of *An. tortilis,* doubtful. V. 48.
" " " *U. Conradicus.* I. 176.
" Uniones. [See Undulate Uniones.]
Plications or folds, how formed. I. 74.
Polished disk and beaks. *U. Whiteianus.* V. 15.
Ponderous shells. *An. arcuata* and *An. subcrassa.* VII. 55.
Ponderous shells, rarely free from erosion. I. 27.
Posterior and anterior of Uniones, reversed. I. 1, 3.
" cicatrix. I. 4.
" muscle of foot. I. 28.
" slope angular. Plagiodon. VI. 38. *An. angulata.* II. 97.
Posterior slope broad and corrugately folded. *U. Anthonyi.* IX. 20.
Posterior slope broadly furrowed. *U. rudus.* VII. 84.
Posterior slope carinate. *U. Cambodiensis.* VI. 33.
" " elevated line on. *U. Nicklinianus.* III. 72.
Posterior slope elevated into a keel. *U. Jamesianus.* VI. 53.
Posterior slope flat. *U. ovatus.* I. 50, 51.
" " folded or wrinkled. *Marg. triangulata.* VII. 46.
Posterior slope with a row of tubercles. *U. Rumphianus.* V. 32.
Posterior slope wrinkled. *U. corvus.* VII. 35.
" " yellow. *U. castaneus* and *circulus.* I. 101.
Posterior slope yellow, like *ebenus.* *U. nux.* V. 40.
Pouch-shaped embryos. VI. 44. [See Embryos.]
Probable unimusculose character of embryonic Uniones. VI. 45.
Process, fleshy, of *U. luteolus,* like *radiatus.* X. 38. [See II. 53.]
Process, ocellated, of mantle of *U. lineatus,* like *radiatus.* X. 43.
Process, white, thread-like, in *U. perplexus* and *cariosus.* X. 56.
Profusion of Uniones in eastern North America. V. 42.
Profusion of Uniones west of the Alleghany Mountains. I. 20.
Radiate folds of Beaks of South American Unionidæ. III. 38; VII. 72, 83; XII. 45. [See Beaks.]
Ravenel (letter) on *U. angustatus.* I. 125.
Rayed species. I. 25.
" specimens. *U. ovatus.* I. 25.
Ray, interrupted, indistinct. *U. brevidens.* I. 86.
Rays, broad, interrupted, and zigzag. I. 26, 55.
" " " *U. interruptus.* II. 16.
" large, interrupted. *U. pustulosus.* I. 87, 89; II. 11.
Rays, broken into irregular spots. *U. perdix,* I. 185. *U pictus,* I. 186.
Rays, capillary. *U. turgidulus.* VIII. 67.
" hair-line. *U. perpurpuratus.* XI. 51.
" not specific. I. 5.
" peculiar. *U. securis.* I. 25, 51.
Rectification of Conrad's Synopsis. Remarks on. X. Introduction.

Red ova. *U. Æsopus*, *rubiginosus*, and *subrotundus.* X. 52, 53, 64, 68.
Red inside— "*U. ellipsis, var. a.*" I. 11.
" soft parts. *U. trigonus.* II. 55; X. 65.
" spermatic matter. *U. subrotundus.* X. 64.
" "Spongy Mass." Branchial opening of *U. paulus.* VII. 39.
Red spots on oviducts. *U. phaseolus.* VII. 38.
" tint of *An. rubicunda.* X. 28.
Remarkable elevation of spire of *Megaspira Ruschenbergiana.* II. 21.
Remarkable folds. *U. plicatulus.* VII. 65.
" form and green rays of *U. Edgarianus.* III. 53.
Remarkable lateral tooth. *U. extensus.* VI. 69.
" lines of growth. *U. perstriatus.* V. 11.
" striæ of *U. percoarctatus.* VIII. 63.
" teeth. *U. gracilis*, I. 67. *U. macrodon*, IX. 16.
Remarkable transverse crimpling. *U. occatus*, X. 34.
Resemblance of *U. spinosus* to *Cytherea Dione.*
Ribs, divergent, reëntering; beaks of *U. suavidicus* and *Wheatleyi.* VI. 28, 30.
Roof-shaped, spire. *Melania Cincinnatiensis.* III. 29.
Rotund form. *An. Cailliaudii.* X. 31.
Rough tuberculous deposits in nacre. *An. salmonia.* II. 46.
Round black spot, mantle of *U. luteolus.* X. 38.
Row of dorsal cicatrices. [See Cicatrices.]
Rows of tubercles on hooks of embryos. VI. 45.
Rudimentary cardinal teeth. IV. 56. [See Teeth, rudimentary.]
Rudimentary teeth. I. 68; VII. 56, 57, 58; VIII. 49. [See Teeth, incipient.]
Sacks and oviducts, peculiar. *U. irroratus.* I. 13.
Satin-like nacre. [See Nacre.]
Schizostoma. Habitat. IX. 68.
" reasons for retaining the genus. IX. 67.
" two groups. IX. 68.
Sensitive to light. [See Light.]
Serrated hooks of embryos. VI. 45.
" opercle of *Lithasia fusiformis.* IX. 84.
Sexes of Uniones. Species referred to in Vol. XIII., page 42.
Sexual characters conjectured. I. 3.
" differences, evidences of. II. 49.
Shell fragile. *U. tenuissimus.* I. 68.
Shell remarkably tuberculate. *U. speciosus.* IX. 30.
Shells of Appalachicola River unknown. I. 138.
Shells of the Mohawk River, same as those of the Delaware. I. 137.
Sides irregularly flattened. *An. Moricandii.* X. 33.
Sinistral character of *Helix Himalana.* I. 167.
" *Paludina.* II. 90.
Sinuous dorsal line. *An. sinuosa.* I. 206.
Sinus triangular. [See Fosset and Triangular Sinus.]
Size and weight of remarkable specimens. I. 116; VI. 41.
Slight specific differences of Uniones of Lake Nicaragua. XII. 49.
Slit of Bojanus—super-anal opening. X. 38.
Smallest Helix of this country. *H. minutissima.* IV. 18.
Soft parts dark, like *U. monodontus.* *Marg. margaritifera.* VII. 43.
Soft parts, form of, indicated by the shell. I. 19.
" " of Melania (Cuvier). [Foot-note.] IX. 38.
" " of So. American Uniones, first described. XII. 28.
Soft parts of *U. Foremanianus* and *Greenii* possibly like *Woodwardianus.* VIII. 18.
Soft parts of *U. trinacris* supposed to be like *Woodwardianus.* VIII. 91.
Soft parts red. *U. trigonus.* II. 55.
" " variable. *U. radiatus.* [Foot-note.] X. 48, 86. [See II. 53.]
Sombre aspect of *U. carbonarius.* II. 37.
Space between anal and super-anal openings interrupted by holes. *U. lævissimus.* X. 61.
Sparse tubercles. *U. Dorfeuillianus.* II. 73.
Spatha modesta allied to *S. cœlestis.* XI. 42.
Species insensibly glide into each other. I. 20.
" not yet seen eroded. I. 27.
Spermatic matter red. *U. subrotundus.* X. 64.
Spherical species. *U. globatus.* XIII. 9.
Spiral opercle. Amnicola. IX. 38.
Spongy mass or caruncle of female Uniones. [See Caruncle.]
U. glans, white. VII. 39, 40.
U. parvus, black. VII. 39, 40; X. 39.
U. paulus, red. VII. 39, 40; X. 39.
Spot, black, on mantle of female *Uniones dolabræformis*, *lineatus*, *occidens* and *radiatus.* X. 55. [See also II. 53; X. 50.]
Spot, black, round, on mantle of *U. luteolus.* X. 38.
" green, single. *U. Lewisii.* VIII. 75.
" red, on ovisack of *U. phaseolus.* VII. 38.
Spots, broad green, a single row of. *U. favosus.* VI. 59.
Spots, green, in nacre—due to epidermal matter. I. 74.
" green, regular. *U. Camelopardilis.* VIII. 37.
" minute, angular; epidermis of *U. acutissimus* and *parvulus.* XI. 51.
Spots on mantle, characteristic of Margaritana. VIII. 112.
Spots on mantle, square. VII. 44, 46.
" on process of mantle. *U. lineatus* and *radiatus.* X. 43.
Spots on shells. *U. metanever.* I. 6.
" on *U. medius.* VIII. 83.
" row of, on umbonial slope. *U. pallidofulvus.* VIII. 88.
Spotted lines on *U. irroratus.* I. 13.
Spreading posterior of *U. modioliformis.* I. 209.
Square, spotted marks, on mantle of *Marg. Elliottii* and *marginata.* VII. 44.
Striæ, festoon-like. *U. encarpus.* XII. 55.
" remarkable. *U. percoarctatus.* VIII. 63.
Striate teeth, like Prisodon. *U. torulosus.* XII. 46.
" varnished appearance. *U. Estabrookianus.* IV. 51.
Subrotund embryos. VI. 44; XIII. 73. [See Embryos.]

Subtriangular embryos. VI. 44; XIII. 73. [See Embryos.]

Sulcate disks of Uniones of Lake Nicaragua. XII. 52.

" Uniones, group of. VI. 22.

" " of South America, group of. XII. 57.

Sulcate Unionidæ. *An. Hallenbeckii*, VII. 50. *Spatha alata*, XI. 39. *Spatha Natalensis*, XI. 68. *U. aratus*, IV. 40. *U. Averyi*, VII. 87. *U. Caldwellii*, VII. 83. *U. cyrenoides*, VII. 87. *U. Demeraraensis*, VII. 71. *U. Dysonii*, VII. 70. *U. effulgens*, VI. 23. *U. encarpus*, XII. 55. *U. Gabbianus*, XII. 55. *U. Granadensis*, XII. 53. *U. Jeffreysianus*, XIII. 23. *U. melleus*, VII. 68. *U. Meredithii*, VII. 69. *U. Newcombianus*, VI. 32. *U. Nicaraguensis*, XII. 56. *U. Paramattensis*, XI. 64. *U. persulcatus*, VII. 73. *U. Rowellii*, VII. 74. *U. rubidus*, VIII. 100. *U. rugososulcatus*, XII. 27. *U. scamnatus*, VI. 22; VII. 77. *U. Shuttleworthii*, VI. 24. *U. sulcatus*, I. 44. *U. Syriacus*, XI. 60. *U. tripartitus*, XI. 61. *U. Verreauianus*, VI. 22. *U. vittatus*, VII. 67.

Swainson and Sowerby on ALASMODON. I. 57.

" on Lamarck's species. I. 35.

Swainson's division of the family NAIADES. II. 115.

Symphynote characters not generic. I. 77.

" [See Winged or Alate Uniones.]

Syphons of *Marg. rugosa.* (Agassiz.) X. 82.

Teeth, abnormal double. I. 22.

" anomalous and imperfect. *U. soleniformis.* I. 98.

Teeth, arched arrangement of. *U. compactus.* VII. 37.

Teeth, arch between, remarkable. *U. Woodwardianus.* VII. 18, 37.

Teeth, cardinal, double and single. I. 22.

" " " in right, single in left valve, characteristic of Uniones of the Asiatic Islands. VII. 76.

Teeth, cardinal, divided in 8 or 9 denticles. *U. Ortonii.* XII. 81.

Teeth, cardinal, double in right valve, treble in left. *U. genuinus*, XII. 65. *U. pruinoides*, XII. 84.

Teeth, cardinal, double in left valve, treble in right. *U. Kullethensis*, XII. 11. *U. Mardinensis*, XII. 12. *U. refulgens*, XII. 77.

Teeth, cardinal, much divided. *U. disculus.* X. 22.

" " nearly trifid. *U. tenebricus.* VI. 84.

" " of unusual form. *U. Nagpoorensis.* VII. 88.

Teeth, cardinal, peculiar. *U. pellucidus.* IV. 45.

" " remarkably divided. *U. apprimus*, XII. 24. *U. gratus*, X. 19.

Teeth, cardinal, remarkably small. *U. compressissimus*, IV. 55. *U. neglectus*, IV. 39.

Teeth, cardinal, remarkable. *U. delphinus*, III. 57. *U. macrodon*, IX. 16.

Teeth, cardinal, rudimentary. *An. tetragona.* IV. 56.

" " single in both valves. *Marg. Georgiana*, VII. 46. *U. Bengalensis*, II. 3. *U. concavus*, V. 16. *U. rubiginosus*, I. 42.

Teeth, cardinal, small and granular. *U. ahénus.* IV. 38.

Teeth, cardinal, subdivided. *U. acutirostris.* XII. 31.

" " three lobed in both valves. *U. funebralis.* X. 15.

Teeth, cardinal, treble. *U. pilatus.* XII. 39, 42.

" " trifid. *Marg. Holstonia*, VII. 45. *U. crapulus*, XI. 46. *U. Wymanii*, X. 18.

Teeth, cardinal, trifid in both valves. *U. Gibbesianus*, V. 11. *U. trifidus*, X. 23.

Teeth, cardinal, trifid in right valve. *U. Couchianus.* VIII. 53.

Teeth, cardinal, tripartite. *U. encarpus*, XII. 55. *U. Gibbesianus*, V. 11. *U. Nicaraguensis*, XII. 56.

Teeth, cardinal, triple. *U. contiguus.* IX. 22.

" " " in left valve. *Marg. Holstonia.* II. 42.

Teeth, cardinal, triplication of. *U. peculiaris*, XII. 26.

" " trifid in right, double in left valve. *U. Leibii.* XI. 48.

Teeth, cardinal, triple in right valve. *U. Cahabensis*, XIII. 18. *U. litus*, XIII. 17. *U. Pealei*, XIII. 26. *U. Tuscumbiensis*, XIII. 11.

Teeth, cardinal, remarkably small. *U. contiguus.* IX. 22.

Teeth, character of, in MONOCONDYLÆA. VI. 37.

" incipient, in young of ANODONTA and *An. Texasensis*, VIII. 49. [See Incipient and Rudimentary teeth.]

Teeth, lateral, abnormal, single in both valves. *U. dolosus.* VIII. 80.

Teeth, lateral, crenulate in HYRIA. II. 109.

Teeth, lateral, double in both valves. *U. Afferulus*, XI. 38. *U. dolosus*, VIII. 79. *U. Leibii*, XI. 48. *U. melleus*, VII. 68. *U. nucleus*, VI. 27. *U. Nyassaensis*, XI. 37. *U. phaselus*, VI. 17. *U. scobinatus*, VI. 19. *U. Showalterii*, VIII. 78. *U. Thorntonii*, XI. 42.

Teeth, lateral, double in right valve. *U. heterodon*, I. 43.

Teeth, lateral, double in right valve, treble in left. *U. eximius*, VI. 15. *U. Kirkii*, XI. 36. *U. Rajahensis*, III. 77. *U. tripartitus*, XI. 61, 62.

Teeth, lateral, double in right valve, single in left. *U. bulloides*, VII. 83.

Teeth, lateral, single in both valves. *U. hyalinus*, IV. 43. *U. Jeffreysianus*, XIII. 28. *U. Tappanianus*, II. 63.

Teeth, lateral, striate, like PRISODON. *U. tortuosus*, XII. 46.

Teeth, lateral, trifid in right valve. *U. trifidus*, X. 23. XI. 62.

Teeth, lateral, tripartite. *U. Kirkii*, XI. 37. *U. tripartitus*, XI. 61, 62.

Teeth, lateral, remarkable. *U. Rumphianus.* V. 33.

" " remarkably small. *U. pressus.* X. 59.

" long, acicular. *Mycetopus emarginatus.* X. 35.

" massive and corrugated. *U. Blandianus.* VI. 66.

" not a specific test. I. 21, 22.

" obscure. *U. creperus.* II. 33.

" of CASTALIA, crenulate. I. 117. Longitudinally furrowed. I. 57.

Teeth of South American MONOCONDYLŒA. XII. 33.
" " " " Uniones. *U. pruinoides.* XII. 84.
Teeth, peculiar. *U. oriens*, I. 78, 84. *U. Tappanianus*, II. 63.
Teeth, pink. *U. cylindricus*, I. 116. *U. perdix*, I. 185. *U. securis*, I. 116. *U. Tampicoensis*, II. 25. *U. Veracruzensis*, XII. 81.
Teeth, remarkable. *U. pressus*, I. 65. *U. spinosus*, II. 59.
Teeth, rudimentary. *An. crepera* and *tenuis*, VII. 56, 57. *U. tenuissimus*, I. 68.
Teeth, small. *Marg. Elliottii.* VII. 45.
" " and linear. *U. Bengalensis.* II. 3.
" surface of, covered with a prolongation of the mantle. I. 5.
Teeth, tripartite in left valve. *U. Berlandierii.* VIII. 52.
Tentacles. VI. 55.
Territory unexplored. VIII. Introduction.
Testaceous connection of valves above the hinge. I. 56.
Thickening of valves, anteriorly, unusual. *U. Nagpoorensis.* VII. 88.
Thick ANODONTÆ. *An. arcuata*, *latomarginata*, and *subcrassa.* VII. 55.
Third anterior cicatrix. *U. cucumoides*, III. 31, 57. *U. delphinus*, III. 57.
Tooth, incipient. *An. Ferussaciana*, I. 157. *An. pavonia*, II. 79.
Tooth, obsolete, lamelliform. *Dipsas plicatus.* I. 61.
" prominent and curved. *Marg. calceola.* I. 7.
" recurved. *U. gracilis.* I. 67.
" subtuberculous, in both valves. *Marg. elliptica.* VIII. 111.
Tractor muscles. *Marg. margaritifera.* VII. 43.
Transverse character of *U. Grayanus.* I. 179.
Transverse shells. *Mycetopus emarginatus*, X. 35. *U. angustatus*, I. 125. *U. folliculatus*, II. 38. *U. Grayanus*, I. 178. *U. rostriformis*, VI. 64. *U. Shepardianus*, I. 208.
Triangular fosset of South American Anodontæ. [See Fosset and Triangular Sinus.] *An. Holtonis*, VI. 37. *An. Linnœana*, V. 46. *An. luteola*, VII. 86. *An. obtusa*, VII. 86. *An. Schröteriana*, V. 49. *An. tortilis*, V. 48. *An. Trautwiniana*, V. 43, 44, 48. *An. Wheatleyi*, V. 44.
Triangular sinus of South American Anodontæ. [See Fosset.] *An. Amazonensis*, X. 32. *An. exotica*, I. 191. *An. Forbesianus*, X. 29. *An. latomarginata*, I. 188. *An. rubicunda*, X. 28. *An. tenebricosa*, I. 191. *An. Uruguayensis*, X. 30. *An. Wymanii*, X. 27.
Tripartite character of teeth of Uniones of Lake Nicaragua. XII. 57.
Tuberculate and nodular Uniones. *U. Æsopus*, I. 25. *U. apiculatus*, IX. 30. *U. asper*, I. 95. *U. asperatus*, VIII. 72. *U. asperrimus*, I. 81. *U. Blandianus*, VI. 65. *U. Cahabensis*, XIII. 21. *U. Chinensis*, XII. 85. *U. Cincinnatiensis*, III. 32. *U. Cooperianus*, I. 173. *U. cylindricus*, I. 24. *U. Dorfeuillianus*, II. 73. *U. Forsheyi*, VIII. 39. *U. graniferus*, II. 69. *U. irroratus*,
Tuberculate and nodular Uniones—
I. 183. *U. Kienerianus*, V. 37. *U. lachrymosus*, I. 14. *U. Lamarckianus*, V. 22. *U. pernodosus*, IV. 45. *U. perplexus*, I. 123. *U. propinquus*, VIII. 67. *U. pustulatus*, I. 89. *U. pustulosus*, I. 86. *U. Rangianus*, II. 95. *U. refulgens*, XII. 77. *U. Rumphianus*, V. 32. *U. rusticus*, VI. 14. *U. Sampsonii*, IX. 14. *U. Schoolcraftii*, I. 149. *U. sparsus*, III. 80. *U. speciosus*, IX. 29. *U. sphericus*, XII. 79. *U. stapes*, I. 87. *U. tuberosus*, III. 48. *U. turgidus*, II. 11. *U. vallatus*, XII. 75. *U. varicosus*, I. 100. *U. verrucosus.*
Tubercles and undulations. I. 24, 25.
" curved row of. *U. Rumphianus.* V. 33.
" formation of. I. 73, 74.
" indistinct. *U. Schoolcraftii.* I. 150.
" numerous on umbo of *U. turgidus.* II. 11.
" on dorsal line. *Iridina exotica.* I. 206.
" peculiar form of. *U. lachrymosus.* I. 15.
" " *U. pustulatus* and *pustulosus* compared. I. 89, 90.
Tubercles, remarkable. *U. asper*, I. 96. *U. Forsheyi*, VIII. 40.
Tubercles, rows of, forming acute angles. *U. Blandianus.* VI. 65.
Tubercles, sparse. *U. Dorfeuillianus.* II. 73.
" triangular. *U. stapes.* I. 88.
Tubercular shells, none in the Chattahoochee river. III. 46.
Tubercular shell, remarkable. *U. speciosus.* IX. 30.
Twisted shell. *Triquetra contorta*, VI. 39. *U. tortuosus*, XII. 46.
Two colors of epidermis of *U. circulus.* I. 48.
Umbonial angle of *An. Shaefferiana.* V. 45.
" slope angular. *An. angulata*, II. 97. *An. tetragona*, IV. 56. *Marg. triangulata*, VII. 46. *U. Bengalensis*, II. 3. *U. Dariensis*, III. 84. *U. rufusculus*, V. 14. *U. sagittæformis*, V. 33.
Umbonial slope, carinate. *U. Rajahensis.* III. 77.
Undulate, plicate, or folded Uniones. *An. tortilis*, V. 48. *Marg. arcula*, II. 71. *Marg. complanata*, I. 64. *U. acutissimus*, I. 99. *U. Aferulus*, XI. 38. *U. asperulus*, XII. 40. *U. atrocostatus*, IV. 44. *U. atromarginatus*, III. 45. *U. Boykinianus*, III. 46. *U. Brazosensis*, XII. 69. *U. Burroughianus*, I. 179. *U. Conradicus*, I. 75. *U. crispatus*, VI. 16, 17. *U. cucumoides*, III. 30. *U. Cumingii*, VII. 59. *U. diminutus*, VII. 72. *U. divaricatus*, I. 176. *U. Dunkerianus*, VI. 25. *U. Elliottii*, VI. 55. *U. ellipticus*, XII. 42. *U. eximius*, VI. 14. *U. fluctiger*, VII. 68. *U. granulatus*, XI. 50. *U. Grayanus*, I. 178. *U. hippopœus*, IV. 41. *U. Homsensis*, XII. 9. *U. humilis*, VI. 16. *U. Kirkii*, XI. 36. *U. Kleinianus*, V. 21. *U. Lampreyanus*, XII. 86. *U. latecostatus*, IV. 42. *U. Leanus*, I. 155. [Footnote.] *U. Lincecumii*, XII. 72. *U. multiplicatus*, I. 80. *U. Murchisonianus*, I. 46. *U. Natalensis*, XI. 63. *U. navigioliformis*, VII. 63. *U. Neislerii*, VII. 31. *U. Nicklinianus*, I. 140. *U. nucleus*, VI. 26. *U. Nyassaensis*, XI. 37.

Undulate, plicate, or folded Uniones—
U. occatus, X. 34. *U. Ortonii*, XII. 81. *U. parvulus*, XI. 49. *U. pauciplicatus*, XIII. 33. *U. penicillatus*, VII. 21. *U. phaselus*, VI. 17. *U. plicatus.** *U. plicatulus*, VII. 63. *U. pliciferus*, II. 61. *U. rubellinus*, VI. 70. *U. rufofuscus*, XII. 42. *U. scobinatus*, VI. 19. *U. Shurtleffianus*, VI. 22. *U. Sloatianus*, III. 55. *U. subtentus*, I. 175. *U. Sumatrensis*, VII. 57. *U. tortuosus*, XII. 46. *U. trapezoides*, I. 79. *U. undulatus.** *U. Wrightii*, XII. 43.
Undulations visible in cavity of beaks. *U. granulatus*. XI. 53.
Undulations visible within. *U. atromarginatus*, III. 45. *U. asperulus*, XII. 41. *U. latecostatus*, IV. 42. *U. Natalensis*, XI. 64.
UNIONES compared to other genera of different orders. I. 19.
UNIONES classed by Linnæus with MYA and MYTILUS. I. 136.
Uniones in confinement in winter without food. I. 21.
" of the Ohio basin found in Texas. XI. 31.
Unio cornutus divisible into four species. I. 123.
Unio luteolus in Great Slave Lake. IX. 36.
Unio mytiloides divisible into four species. I. 121.
Unio Souleyi, a MONOCONDYLŒA. XIII. 13.
Unio spinosus in the Mississippi River. *Bartram*. II. 60.
"*Var. a*," *Unio ellipsis*, red inside. I. 11.
Varicose undulations of *U. varicosus*. I. 100.
Variability of structure and size in species. I. 22.
Variable periods of discharge of ova of Uniones. III. 70.
Varieties of *U. cornutus* that run into *U. Æsopus*. I. 5.
Ventral cicatrix. *Marg. margaritifera*, VII. 43. *U. Baldwinensis*, VIII. 12.
Visual organs. VI. 51. [See Light, Sensitive to.]
Viviparous Uniones. I. 4.
Valves connate over the ligament. *An. Wahlamatensis*. II. 78.
Ventral muscular attachment. *U. Yadkinensis*. XIII. 37.
Wedge-shaped embryos. VI. 44. [See Embryos.]
Weight and size of various large shells. I. 116; VII. 41.
Western species found in Alabama and Tombecbee rivers. I. 138.
Western species found in Lake Champlain. I. 138.
" " " " the great lakes, etc. I. 137.
" " " " " St. Lawrence River. I. 137, 138.
Wide distribution of the common land shells. VII. 41.
Winged shell of *U. delphinus*, remarkable. III. 56.
Winged or Alate Uniones. *An. Benedictii*, I. 216. *An. Californiensis*, V. 43. *An. cygnea*, I. 70. *An. magnifica*, I. 155. *An. Nuttalliana*, II. 77. *An. Oregonensis*, II. 80. *An. rubicunda*, X. 28. *An. Wahlamatensis*, II. 78; X. 90. *An. Woodiana*, I. 154. *Christaria tuberculata*, I. 61. *Dipsas discoideus*, I. 187. *Dipsas plicatus*, I. 61. *Marg. complanata*, I. 62. *Mon. planulata*, VII. 80. *Spatha alata*, XI. 39. *U. alatus*, I. 62. *U. bialatus*, I. 59. *U. bilineatus*, I. 108. *U. Cumingii*, VII. 59. *U. decoratus*, V. 13. *U. delphinus*, III. 56. *U. globosus*, I. 153. *U. gracilis*, I. 66. *U. gravidus*, VI. 12. *U. Hainesianus*, VI. 9. *U. Heermannii*, IX. 16. *U. Houseii*, VI. 11. *U. inflatus*, I. 109. *U. lævissimus*, I. 58. *U. Myersianus*, VI. 10. *U. ochraceus*, I. 69. *U. pressus*, I. 64; V. 13. *U. superbus*, IV. 39. *U. tenuissimus*, I. 67.
Young and old shells necessary to determine species. I. 75.
Zigzag lines, minute folds of *U. Shurtleffianus* VI. 23.
Zigzag rays. *U. donaciformis* and *zigzag*, I. 26, 55. *U. elegans*, I. 93; XI. 37. *U. penicillatus*, VII. 22. *U. rubellinus*, VI. 71.
Zigzag corrugations of *U. Nyassaensis*. XI. 38.

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* See Miscellaneous Species, Index to Vols. I. to XII.

INDEX

TO VOL. I. TO XI. OF

OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTION OF NEW SPECIES OF THE FAMILY UNIONIDÆ.

AND

DESCRIPTIONS OF NEW SPECIES OF THE MELANIDÆ, PALUDINÆ, HELICIDÆ, ETC.

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY AND THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, FROM 1827 TO 1863.

BY

ISAAC LEA, LL. D., ETC.

Vol. I

PHILADELPHIA:
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NOTICE.

Having constantly felt the inconvenience of reference to former papers issued in previous volumes of "Observations on the Genus Unio," &c., I determined, after issuing my eleventh volume, to have an *Index* for the whole, by way of easy reference to all my new species described therein, as well also to every species referred to; also to the soft parts and embryonic forms, thus making the whole more available to the student. My own time being too much occupied with original investigations, I applied to my friend James Lewis, M. D., of Mohawk, N. Y., whose thorough knowledge in this branch of Natural History is so well known. Many of the volumes already testify to his friendly aid from time to time—at once he acceded to my wishes, and the result is now, I believe, a perfect *Index.*

As all the papers embraced in these eleven volumes, with all the plates, were published in the "Transactions of the American Philosophical Society" and the "Journal of the Academy of Natural Sciences," it will facilitate reference to those works by stating that the papers of my

Vol.	1	are printed	in the	Transactions of the	Am.	Phil. Soc.,	Vols.	3, 4 and 5,	new series.
"	2	"	"	"	"	"	"	6,	"
"	3	"	"	"	"	"	"	8,	"
"	4	"	"	"	"	"	"	9 and 10,	"
"	6	"	"	Journal of the Acad. Nat. Sciences,			"	3 and 4.	"
"	7	"	"	"	"	"	"	4.	"
"	8	"	"	"	"	"	"	4 and 5.	"
"	9	"	"	"	"	"	"	5.	"
"	10	"	"	"	"	"	"	5.	"
"	11	"	"	"	"	"	"	6.	"

SECTION I.

UNIONIDÆ OF NORTH AMERICA.

SUBSECTIONS UNIO.
MARGARITANA.
ANODONTA.

UNIO.	Description.	Soft Parts.	Embryo.	MISCELLANEOUS REFERENCES.
abacus *Hald.*				[Check List.]*
aberans *Lea.* (June 16, 1863.)	XI. 11			
Abbevillensis *Lea.* (Mar. 24, 1857.)	VI. 51	X. 81		
Aberti *Con.*				[Check List.]
acutissimus *Lea.* (May 7, 1830.)	I. 99	X. 47	X. 47	VI. 17, 71 : VII. 22 : Byssus X. 46 : XI. 50.
æquatus *Lea.* (June 23, 1857.)	VI. 89	VI. 89		
Æsopus *Green.*		X. 68	X. 52, 53	I. 5, 23, 25, 26, 27, 100 : II. 55 : III. 69, 70 : IV. 51.
affinis *Lea.* (Mar. 5, 1852.)	V. 27			VII. 76.
ahenus *Lea.* (Aug. 18, 1843.)	IV. 38			
alatus *Say.* †	I. 62	X. 39	VI. 45, 48 X. 39	I. 5, 21, 57, 116 : II. 56, 74 : III. 69 : VI. 15, 34, 35 : IX. 17.
altilis *Con.*				[Check List.]
amœnus *Lea.* (Oct. 2, 1840.)	III. 38			
amygdalum *Lea.* (Aug. 18, 1843.)	IV. 33			V. 40 : VIII. 53.
anaticulus *Lea.* (Feb. 5, 1861.)	VIII. 96			
angustatus *Lea.* (May 20, 1831.)	I. 124	X. 41		I. 125 : III. 36 : VI. 68, 83 : VIII. 17.
anodontoides *Lea.* (May 7, 1830.)	I. 91	X. 42	VI. 46 X. 42	I. 99 : II. 132 : V. 30 : XI. 55.
Anthonyi *Lea.* (Feb. 5, 1861.)	IX. 19			
apicinus *Lea.* (Feb. 17, 1857.)	VI. 76	VI. 76		
apiculatus *Say.*				IX. 30 : XI. 38.
approximus *Lea.* (May 2, 1845.)	IV. 48			
aquilus *Lea.* (June 23, 1857.)	VI. 92	VI. 92		
arcæformis *Lea.* (May 20, 1831.)	I. 126			I. 147, 198 : II. 49, 124 : XI. 45.
arctatus *Con.*				[Check List.]
arctior *Lea.* (Dec. 19, 1834.)	II. 10			V. 29 : VI. 54.
arcus *Con.*				[Check List.]
argenteus *Lea.* (June 18, 1841.)	III. 80			VI. 69 : VIII. 31.
Arkansaensis *Lea.* (April 22, 1862.)	IX. 28			
arquatus *Con.*				[Check List.]
asper *Lea.* (May 7, 1830.)	I. 95	X. 73		
asperatus *Lea.* (Feb. 5, 1861.)	VIII. 72	VIII. 73		
asperrimus *Lea.* (May 7, 1830.)	I. 81			I. 150 : II. 56, 123 : III. 69 : VIII. 54.
atro-costatus *Lea.* (May 2, 1845.)	IV. 44	X. 73		
atro-marginatus *Lea.* (Oct. 2, 1840.)	III. 45			
aureus *Lea.* (April 5, 1859.)	IX. 17			XI. 31.

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* The citation of the species from the Check List of the North American Unionidæ of the Smithsonian Institution, formed by me, was thought to be advisable, although these species so cited do not appear in the eleven volumes.

† [Symph. alata *Lea.* Mar. 6, 1829.]

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
Bairdianus *Lea.* (April 7, 1857.)	VIII. 43			VIII. 42.
Baldwinensis *Lea.* (June 21, 1859.)	VIII. 12			
Barrattii *Lea.* (Mar. 5, 1852.)	V. 12	X. 44	X. 44	V. 12, 34: VI. 58.
Barnesianus *Lea.* (Feb. 6, 1836.)	II. 31			III. 32: VIII. 86, 87.
Beadleianus *Lea.* (Feb. 5, 1861.)	VIII. 98			
Bealei *Lea.* (April 22, 1862.)	IX. 26			
biangulatus *Lea.* (Oct. 2, 1840.)	III. 35			
biemarginatus *Lea.* (Mar. 10, 1857.)	XI. 51			VIII. 54, 67.
Bigbyensis *Lea.* (Feb. 19, 1841.)	III. 75			VI. 59: VIII. 90.
Binneyi *Lea.* (May 2, 1845.)	IV. 51			
Blandianus *Lea.* (Nov. 4, 1856.)	VI. 65	VI. 66		VIII. 40.
Blandingianus *Lea.* (Feb. 7, 1834.)	I. 213	X. 71		VIII. 58: XI. 26.
Bournianus *Lea.* (Oct. 2, 1840.)	III. 51			
Boydianus *Lea.* (Oct. 2, 1840.)	III. 54			
Boykinianus *Lea.* (Oct. 2, 1840.)	III. 46	X. 39		
bracteatus *Gould.*				[Check List.]
brevidens *Lea.* (May 7, 1830.)	I. 85			I. 197: II. 49: III. 43: VII. 37.
Brumbyanus *Lea.* (June 18, 1841.)	III. 83			VIII. 26, 93, 105.
Buckleyi *Lea.* (Aug. 18, 1843.)	IV. 34			
Buddianus *Lea.* (Aug. 18, 1843.)	IV. 35			
bulbosus *Lea.* (June 23, 1857.)	VII. 9	VII. 10		
Burkensis *Lea.* (April 5, 1859.)	VII. 33			XI. 17.
buxeus *Lea.* (Mar. 5, 1852.)	V. 17			VI. 80.
cacao *Lea.* (May 10, 1859.)	VIII. 26			VIII. 94.
cælatus *Con.*				[Check List.]
caliginosus *Lea.* (May 2, 1845.)	IV. 53			
callosus *Lea.* (Feb. 19, 1841.)	III. 77			IX. 27.
camelopardilis *Lea.* (Mar. 20, 1860.)	VIII. 37			VIII. 35.
camelus *Lea.* (Feb. 7, 1834.)	I. 214			III. 69.
camptodon *Say.*		X. 52		II. 129: IV. 48: VI. 53, 76.
Canadensis *Lea.* (Mar. 24, 1857.)	VII. 86			
capax *Green.* *	I. 153			II. 125: V. 22.
caperatus *Lea.* (May 2, 1845.)	IV. 49			V. 23.
capsæformis *Lea.* (Mar. 16, 1832.)	I. 143			II. 50, 96: VIII. 67, 89.
cariosus *Say.*				I. 23, 25, 28, 31, 39, 40, 49, 75, 107, 186, 203: II. 49, 51, 53: III. 39, 74: V. 17, 26, 27, 30: VIII. 24, 74, 103.
castaneus *Lea.* (May 7, 1830.)	I. 101	X. 75		IV. 56: VIII. 108.
castus *Lea.* (July 3, 1860.)	VIII. 31			
Catawbensis *Lea.* (Mar. 10, 1857.)	VIII. 58			
Charlottensis *Lea.* (June 16, 1863.)	XI. 12			
Chathamensis *Lea.* (June 16, 1863.)	XI. 25			
Chattanoogaensis *Lea.* (July 6, 1858.)	VII. 27	VII. 27		
Chickasawhensis *Lea.* (Feb. 5, 1861.)	VIII. 105			
Chunii *Lea.* (Dec. 24, 1861.)	IX. 18			
cicur *Lea.* (Feb. 5, 1861.)	VIII. 97			
cinnamomicus *Lea.* (Feb. 5, 1861.)	VIII. 104			
Cincinnatiensis *Lea.* (Oct. 2, 1840.)	III. 32			
circulus *Lea.* (Mar. 6, 1829.)	I. 47	X. 74		I. 20, 23, 26, 28, 37, 87, 90, 101, 116: II. 130: III. 69, 70, 71: VII. 70: VIII. 41, 98.
cistellæformis *Lea.* (June 16, 1863.)	XI. 23			
Claibornensis *Lea.* (Jan. 5, 1838.)	II. 105	X. 72	X. 72	
Clarkianus *Lea.* (Mar. 5, 1852.)	V. 29			
clavus *Lam.*		X. 77		I. 36, 201: II. 55: VIII. 34: XI. 44, 47.
coccineus *Lea.* (Dec. 19, 1834.)	II. 12	X. 59		VIII. 86, 90.
collinus *Con.*				[Check List.]
Coloradoensis *Lea.* (May 13, 1856.)	VI. 34			
Clinchensis Lea	XI. 38			

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* [Symph. globosa *Lea.* March 16, 1832.]

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
Columbensis *Lea.* (Feb. 17, 1857.)	VI. 75	VI. 75		
compactus *Lea.* (April 19, 1859.)	VII. 36	X. 80	X. 80	
compressissimus *Lea.* (May 2, 1845.)	IV. 55			
complanatus *Solander.* *		X. 48		I. 22, 23, 25, 30, 36, 38, 83, 87, 102, 104, 107, 125, 138, 151, 200, 201, 202, 214, 215, 216: II. 9, 27, 29, 30, 31, 35, 38, 52, 53, 54, 129, 130: III. 36, 42, 56, 58, 68, 73, 78: IV. 34, 36, 37, 53: V. 10, 11, 14, 15, 19, 20, 29: VI. 52, 58, 61, 80, 81, 82, 85, 86, 87, 88, 90: VII. 19, 33, 73: VIII. 11, 16, 17, 19, 30, 46, 63, 65, 66: IX. 13, 25, 32: XI. 11, 16, 19, 22, 60.
concavus *Lea.* (Mar. 5, 1852.)	V. 16			V. 18: VII. 12, 20.
concestator *Lea.* (Feb. 17, 1857.)	VI. 66	VI. 67	VI. 67	VI. 73: IX. 22.
concolor *Lea.* (Feb. 5, 1861.)	VIII. 93			
confertus *Lea.* (Feb. 7, 1834.)	I. 215			II. 31: III. 41: V. 15: VI. 22, 85: VIII. 58.
Congaræus *Lea.* (May 7, 1830.)	I. 82			III. 84: V. 14, 16: XI. 11.
Conradicus *Lea.* (Mar. 15, 1833.)	I. 175	X. 47	X. 46 Byssus.	VI. 71: VII. 22: XI. 50.
consanguineus *Lea.* (Mar. 5, 1861.)	VIII. 71			
constrictus *Con.*				V. 36.
contiguus *Lea.* (Dec. 24, 1861.)	IX. 21			
contractus *Lea.* (Mar. 10, 1857.)	IX. 25			
contradens *Lea.* (Nov. 2, 1836.) †	II. 75			
Cooperianus *Lea.* (Mar. 15, 1833.)	I. 173	X. 66		III. 69: IV. 46.
cor *Con.*				III. 54: VIII. 75: XI. 46.
cornutus *Barnes.*		II. 55 X. 65		I. 5, 23, 24, 25, 32, 68, 90, 123: II. 55, 59: III. 69: XI. 31.
coruscus *Gould.*				[Check List.]
corvus *Lea.* (April 5, 1859.)	VII. 35			
crapulus *Lea.* (Feb. 5, 1861.)	XI. 46			
crassidens *Lam.*		X. 46		I. 31, 35, 199: II. 35, 37, 40, 56, 74, 125: III. 56: IV. 38: IX. 11, 16, 24.
crebrivittatus *Lea.* (Mar. 5, 1861.)	XI. 47			VIII. 72.
creperus *Lea.* (Feb. 5, 1836.)	II. 33			
crocatus *Lea.* (Feb. 19, 1841,)	III. 76	X. 74		V. 27, 30: VI. 34: VIII. 103.
Cumberlandianus *Lea.* (Sept. 18, 1835.)	II. 25			II. 26: VII. 21: VIII. 22, 28. [Cumberlandicus, Vol. II.]
cuneolus *Lea.* (Oct. 2, 1840.)	III. 31			
curatus *Lea.* (June 16, 1863.)	XI. 27			
curtus *Lea.* (April 5, 1859.)	VIII. 107	VIII. 107		VIII. 96.
Cuvierianus *Lea.* (Mar. 5, 1852.)	V. 19			VI. 81, 82.
cylindricus *Say.*		X. 57		I. 6, 21, 23, 24, 26, 27, 28, 37, 116, 172, 201: II. 55: III. 68, 69: VI. 36, 51.
dactylus *Lea.* (Oct. 2, 1840.)	III. 34			
Dariensis *Lea.* (Oct. 21, 1842.)	III. 84	X. 40		VI. 62.
decisus *Lea.* (May 7, 1830.)	I. 102	X. 41		V. 35, 40: VII. 28: VIII. 72, 96, 108: XI. 47.
declivis *Say.* ‡	I. 150	X. 73		II. 129, 130: IV. 48: VI. 76.
decoratus *Lea.* (Mar. 5, 1852.)	V. 13			
decumbens *Lea.* (Feb. 5, 1861.)	VIII. 91			
denigratus *Lea.* (June 23, 1857.)	VII. 18	VII. 19		VII. 17: VIII. 13.
discrepans *Lea.* (Mar. 20, 1860.)	VIII. 22			
dispar *Lea.* (July 3, 1860.)	VIII. 9			
dolabræformis *Lea.* (Jan. 5, 1838.)	II. 103	X. 49	X. 50	
dollabelloides *Lea.* (Oct. 2, 1840.)	III. 53			XI. 42, 43.

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* [Mya complanata *Solander.*]

† [Locality uncertain.]

‡ [geometricus *Lea.* Mar. 16, 1832.]

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
dolosus *Lea.* (July 3, 1860.)	VIII. 79	VIII. 79	VIII. 80	
donaciformis *Lea.* (Nov. 2, 1827.)	I. 9			I. 8, 23, 26, 55, 93, 94: II. 124.
Dorfeuillianus *Lea.* (Nov. 4, 1836.)	II. 73			
Downiei *Lea.* (July 6, 1858.)	VII. 28	VII. 29		VII. 27.
dromas *Lea.* (Mar. 15, 1833.)	I. 182			IV. 49: V. 23.
Duttonianus *Lea.* (Feb. 19, 1841.)	III. 74			VIII. 17.
dorsatus Lea	XII 60			
ebenus *Lea.* (Mar. 7, 1830.)	I. 94	X. 60		I. 128: III. 48, 69: V. 40: VIII. 78, 95.
Edgarianus *Lea.* (Oct. 2, 1840.)	III. 52			IV. 45: XI. 43.
Eightsii *Lea.* (July 3, 1860.)	VIII. 49			
elegans *Lea.* (May 7, 1830.)	I. 93			II. 124: III. 69: XI. 37.
Elliottii *Lea.* (Nov. 4, 1856.)	VI. 54	VI. 55		
ellipsis *Lea.* (Nov. 2, 1827.)	I. 10	X. 68		I. 5, 11, 22, 23, 26, 27, 28, 45, 101, 142: II. 55, 126: III. 69: IX. 11.
Emmonsii *Lea.* (Mar. 10, 1857.)	VIII. 60	X. 81		
errans *Lea.* (Nov. 4, 1856.)	VI. 60	VI. 61		
Estabrookianus *Lea.* (May 2, 1845.)	IV. 51			VIII. 70.
exactus *Lea.* (Mar. 23, 1858.)	VIII. 66			
excavatus *Lea.* (Feb. 17, 1857.)	VI. 71	VI. 72	VI. 72	
exiguus *Lea.* (Dec. 1, 1838.)	III. 29	X. 54		VI. 57: VIII. 10, 36.
extensus *Lea.* (Feb. 17, 1857.)	VI. 67	VI. 68		VI. 94: VII. 34.
fabaceus *Lea.* (Feb. 5, 1861.)	VIII. 94			
fabalis *Lea.* (May 7, 1830.)	I. 96	X. 59, 84		II. 128: III. 61, 69: V. 17, 18.
fallax *Lea.* (Feb. 17, 1857.)	VI. 79	VI. 79	VI. 80	VI. 74, 77: VII. 27.
famellicus *Gould*				[Check List.]
fatuus *Lea.* (Oct. 2, 1840.)	III. 39			
favosus *Lea.* (Nov. 4, 1856.)	VI. 58	VI. 59		
fibuloides *Lea.* (April 19, 1859.)	VII. 37	X. 79		
Fisherianus *Lea.* (Dec. 19, 1834.)	II. 8	X. 92		V. 34: VI. 65: VIII. 61: XI. 16.
flavescens *Lea.* (May 2, 1845.)	IV. 46			
flavidulus *Lea.* (Feb. 5, 1861.)	VIII. 101			
Florentinus *Lea.* (Mar. 24, 1857.)	VIII. 68			VIII. 67.
Floridensis *Lea.* (Mar. 5, 1852.)	V. 30			
foliatus *Hild*		X. 79	X. 79	I. 123: II. 55, 122: III. 69: V. 34, 35.
folliculatus *Lea.* (Feb. 5, 1836.)	II. 38			III. 75, 76: V. 16.
Forbesianus *Lea.* (Mar. 5, 1852.)	V. 20			VI. 89: VII. 35, 36: IX. 12.
Foremanianus *Lea.* (Oct. 21, 1842.)	III. 85	X. 79	X. 80	VII. 18, 36.
Forsheyi *Lea.* (May 10, 1859.)	VIII. 39	VIII. 40		IX. 30.
fragosus *Con.*				II. 123: III. 69.
fraternus *Lea.* (Mar. 5, 1852.)	V. 19	X. 46		
fucatus *Lea.* (Mar. 20, 1860.)	VIII. 35			VIII. 28.
fulgidus *Lea.* (May 2, 1845.)	IV. 47			VIII. 77.
fuliginosus *Lea.* (May 2, 1845.)	IV. 52			
fulvus *Lea.* (Feb. 7, 1834.)	I. 208			V. 14: VIII. 59.
fumatus *Lea.* (June 23, 1857.)	VI. 88	VI. 88		VI. 89: VII. 15, 36: VIII. 30: IX. 23, 24.
furvus *Con.*				[Check List.]
fuscatus *Lea.* (Aug. 18, 1843.)	IV. 35			XI. 51.
Gastonensis *Lea.* (June 16, 1863.)	XI. 24			
Geddingsianus *Lea.* (Oct. 2, 1840.)	III. 40			V. 15: VI. 91.
geminus *Lea.* (Nov. 4, 1856.)	VI. 63	VI. 64		
Genthii *Lea.* (Mar. 10, 1857.)	VIII. 61			
Georgianus *Lea.* (Feb. 19, 1841.)	III. 73			
Gerhardtii *Lea.* (April 22, 1862.)	IX. 30			
germanus *Lea.* (Feb. 5, 1861.)	XI. 53	XI. 54		
gibber *Lea.* (Feb. 5, 1836.)	II. 35			
Gibbesianus *Lea.* (Mar. 5, 1852.)	V. 10			
gibbosus *Barnes*		X. 53	X. 53	I. 5, 23, 26, 46, 201, 214: II. 10, 37, 131: III. 33, 69: VI. 54: XI. 31.

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
glaber *Lea.* (Feb. 5, 1836.)	II. 34			VIII. 23.
glandaceus *Lea.* (Mar. 5, 1861.)	VIII. 81			
glans *Lea.* (May 7, 1830.)	I. 92	X. 41	X. 41	II. 7, 129 : III. 83 : IV. 33, 43 : V. 40 : VI. 73 : VII. 16.
Gouldii *Lea.* (May 2, 1845.)	IV. 50			
gracilentus *Lea.* (Mar. 10, 1857.)	VIII. 62			
gracillior *Lea.* (Nov. 4, 1856.)	VI. 56	VI. 56		
gracilis *Barnes*.*	I. 66	X. 70		II. 56 : III. 69 : VII. 16, 48.
grandidens *Lea.* (April 22, 1862.)	IX. 27			
graniferus *Lea.* (Aug. 19, 1836.)	II. 69			
granulatus *Lea.* (Mar. 5, 1861.)	XI. 52			
Greenii *Con.*				IV. 47 : VII. 18.
Griffithianus *Lea.* (Feb. 7, 1834.)	I. 215			XI. 28.
Haleianus *Lea.* (Oct. 21, 1842.)	III. 85			IV. 54 : V. 25.
Hallenbeckii *Lea.* (June 21, 1859.)	VIII. 10	VIII. 11	VIII. 11	VI. 83 : VIII. 15, 18.
Hanleyianus *Lea.* (Mar. 5, 1852.)	V. 35			VII. 10 : VIII. 26, 88, 89, 101.
Hartmanianus *Lea.* (July 3, 1860.)	VIII. 77			
Haysianus *Lea.* (Mar. 16, 1832.)	I. 147			I. 142, 181 : VI. 75.
Hazlehurstianus *Lea.* (July 6, 1858.)	VII. 29	VII. 30		
hebes *Lea.* (Mar. 5, 1852.)	V. 23			VIII. 21, 95 : XI. 10.
hebetatus *Con.*				[Check List.]
Heermanii *Lea.* (Dec. 24, 1861.)	IX. 16			
Hembeli *Con.*				V. 19 : VII. 63.
hepaticus *Lea.* (May 10, 1859.)	VIII. 30			
heterodon *Lea.* (Mar. 6, 1829.)	I. 42	X. 78		I. 23, 25 : II. 56.
Higginsii *Lea.* (Mar. 24, 1857.)	IX. 10			
hippopæus *Lea.* (May 2, 1845.)	IV. 41			
Holstonensis *Lea.* (Oct. 2, 1840.)	III. 50			
Hopetonensis *Lea.* (Feb. 5, 1836.)	II. 29	X. 51		V. 19 : VI. 25.
Houstonensis *Lea.* (May 10, 1859.)	VIII. 40	VIII. 41		VIII. 54.
hyalinus *Lea.* (May 2, 1845.)	IV. 43			IV. 45.
Hydianus *Lea.* (Dec. 19, 1834.)	II. 14			II. 106 : IV. 49, 50.
incrassatus *Lea.* (Oct. 2, 1840.)	III. 55	X. 45	X. 45	V. 20 : VII. 35.
indefinitus *Lea.* (June 16, 1863.)	XI. 19			
ineptus *Lea.* (Mar. 5, 1852.)	V. 17			XI. 25.
inflatus *Lea.*†	I. 109	X. 71		
infucatus *Con.*		X. 43		V. 21.
insulsus *Lea.* (Mar. 10, 1857.)	VIII. 57			
instructus *Lea.* (Mar. 5, 1861.)	VIII. 86			VIII. 76, 82.
intercedens *Lea.* (Feb. 17, 1857.)	VI. 77	VI. 77		VI. 80 : VIII. 10.
intermedius *Con.*				III. 49 : V. 23.
interruptus *Lea.* (Dec. 19, 1834.)	II. 15			II. 76 : III. 72 : VIII. 33.
interventus *Lea.* (Mar. 5, 1861.)	VIII. 88			
inusitatis *Lea.* (June 21, 1859.)	VIII. 15	VIII. 16		VIII. 97 : XI. 18.
iris *Lea.* (Mar. 6, 1829.)	I. 53	X. 55		I. 23, 25, 149, 176 : II. 25, 33, 34, 41, 105, 133 : III. 30, 40 : IV. 54 : VIII. 32, 39.
irrasus *Lea.* (Feb. 5, 1861.)	VIII. 95			
irroratus *Lea.* (Nov. 2, 1827.)	I. 11	I. 12 X. 69		I. 5, 20, 23, 25, 26, 28, 182, 183 : II. 50, 123 : III. 69 : IV. 49 : V. 23 : IX. 28 : X. 37.
Jamesianus *Lea.* (Mar. 24, 1857.)	VI. 52			
Jayensis *Lea.* (Feb. 5, 1836.)	II. 28			
jejunus *Lea.* (Dec. 19, 1834.)	II. 9			
Johannis *Lea.* (June 21, 1859.)	VIII. 25			
Jonesii *Lea.* (June 21, 1859.)	VIII. 21			

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* [Symph. gracilis *Lea.* Mar. 6, 1829.]

† [Symphynota inflata *Lea.* May 7, 1830.]

UNIO.	Description.	Soft Parts.	Embryo.	MISCELLANEOUS REFERENCES.
Kienerianus *Lea.* (Mar. 5, 1852.)	V. 37			
Kirtlandianus *Lea.* (Feb. 7, 1834.)	I. 210			
Kleinianus *Lea.* (Mar. 5, 1852.)	V. 21	X. 40, 53		
lacrymosus *Lea.* (Nov. 2, 1827.)	I. 14	X. 67		I. 21: 23, 24, 25, 27, 28, 74, 82, 96: II. 123: III. 69, 70: VI. 66: VIII. 40.
lævissimus *Lea.**	I. 58	X. 61	VI. 45, 48 X. 61	III. 57, 69: XI. 39.
Lamarckianus *Lea.* (Mar. 5, 1852.)	V. 22			V. 23.
lanceolatus *Lea.* (Nov. 2, 1827.)	I. 8			I. 20, 27, 209: II. 132: III. 35: VIII. 59, 64: XI. 15.
laticostatus *Lea.* (May 2, 1845.)	IV. 42			
latus *Lea.* (June 21, 1859.)	VIII. 16			
Lazarus *Lea.* (Mar. 5, 1852.)	V. 15			
Lecontianus *Lea.* (Feb. 5, 1836.)	II. 40			V. 24: VI. 64: VII. 27, 29, 35: VIII. 84.
Leibei *Lea.* (April 22, 1862.)	XI. 48			
lenior *Lea.* (Oct. 2, 1840.)	III. 42			
lens *Lea.* (May 7, 1830.)	I. 90	X. 64		II. 130: IV. 48.
lepidus *Gould.*				[Check List.]
Lesleyi *Lea.* (July 3, 1860.)	VIII. 34			
Lesueurianus *Lea.* (Oct. 2, 1840.)	III. 33			
Lewisii *Lea.* (Feb. 5, 1861.)	VIII. 75			
Lindsleyi *Lea.* (July 3, 1860.)	VIII. 33			
lineatus *Lea.* (Oct. 2, 1840.)	III. 44	X. 43	X. 43	
lienosus *Con.*				[Check List.]
ligamentinus *Lam.*		X. 60	VI. 47 X. 60	I. 34, 200: V. 32: VI. 78: VII. 16: VIII. 51, 66: IX. 11.
limatulus *Con.*		X. 43		
linguæformis *Lea.* (July 3, 1860.)	VIII. 27			
Livingstonensis *Lea.* (June 16, 1863.)	XI. 18			
lucidus *Lea.* (June 16, 1863.)	XI. 13			
lugubris *Lea.* (Feb. 5, 1836.)	II. 30	X. 50		VII. 30: X. 60.
luridus *Lea.* (Mar. 5, 1852.)	V. 29			VI. 54.
luteolus *Lam.*		X. 38	VI. 47	I. 36, 203: II. 15, 34, 49, 56, 106: III. 69, 70: IV. 53: V. 27, 29: IX. 36: X. 18, XI. 31.
lyonii Lea	XII, 19			
macer *Lea.* (Mar. 10, 1857.)	IX. 24			
Maconensis *Lea.* (June 23, 1857.)	VI. 93	VI. 93		VI. 95.
macrodon *Lea.* (May 10, 1859.)	IX. 15			
maculatus *Con.*				III. 48.
Mahoningensis *Lea.*				[Check List.]
Masoni *Con.*				[Check List.]
Mecklenbergensis *Lea.* (June 16, 1863.)	XI. 21			XI. 16.
mediocris *Lea.* (June 16, 1863.)	XI. 28			
medius *Lea.* (Feb. 5, 1861.)	VIII. 82	VIII. 83		VIII. 87, 96.
Menkianus *Lea.* (Nov. 4, 1836.)	II. 76			VIII. 33.
Mercerii *Lea.* (April 22, 1862.)	IX. 31			
Meredithii *Lea.* (Mar. 23, 1858.)	VIII. 69			VIII. 29.
merus *Lea.* (Mar. 5, 1852.)	V. 16			VII. 72: VIII. 31.
metanevrus *Raf.*		X. 66	X. 67	I. 5, 6, 15, 23, 24, 26, 74, 82: II. 123: III. 49, 69, 81: V. 23, 33: VI. 66: IX. 10: XI. 31.
metastriatus *Con.*				[Check List.]
micans *Lea.* (Mar. 10, 1857.)	VIII. 63			XI. 23.
minor *Lea.* (Aug. 18, 1843.)	IV. 34			IV. 36.
Mississippiensis *Con.*				IX. 22: X. 14.
modicellus *Lea.* (June 21, 1859.)	VIII. 29			VIII. 83: IX. 29.

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* [Symph. lævissima *Lea.* March 6, 1829.]

UNIO.	Description.	Soft Parts.	Embryo.	MISCELLANEOUS REFERENCES.
modicus *Lea.* (June 23, 1857.)	VII. 22	VII. 23	....	
modioliformis *Lea.* (Feb. 7, 1834.)	I. 209	....	....	II. 63: V. 26, 30: VI. 60.
mœstus *Lea.* (June 18, 1841.)	III. 82	....	....	
monodontus *Say.* *	I. 97	X. 58	....	II. 128: III. 31, 69: VII. 43.
Monroensis *Lea.* (Aug. 18, 1843.)	IV. 37	....	....	
Mooresianus *Lea.* (Mar. 24, 1857.)	XI. 43	....	....	
Moussonianus *Lea.* (Mar. 5, 1852.)	V. 24	....	....	
Muhlfeldianus *Lea.* (Feb. 5, 1836.)	II. 41	....	....	II. 32.
multiplicatus *Lea.* May 7, 1830.)	I. 80	VII. 40 X. 53	VI. 46 VII. 40	I. 74, 81, 116, 141: II. 56, 122: III. 69, 71: VII. 9.
multiradiatus *Lea.* (Mar. 6, 1829.)	I. 48	X. 62	VI. 47 X. 62	I. 23, 25: III. 69: VIII. 50, 70: IX. 31.
mundus *Lea.* (Mar. 24, 1857.)	XI. 44	....	....	
mytiloides *Raf.*	....	....	....	I. 5, 11, 23, 26, 95, 120, 121: II. 125.
Nashvillianus *Lea.* (Feb. 7, 1834.)	I. 212	X. 75	....	II. 7, 36: IV. 54: V. 25: VI. 80: VIII. 71: IX. 22.
nasutulus *Lea.* (June 16, 1863.)	XI. 16	....	....	
nasutus *Say.*	....	X. 39	X. 40	I. 20, 23, 25, 37, 125, 172, 201: II. 5, 29, 53, 54, 133: IV. 52: V. 13, 34: VI. 92: VIII. 39, 61.
naviculoides *Lea.* (June 23, 1857.)	VI. 94	VI. 94	....	
negatus *Lea.* (Mar. 5, 1861.)	VIII. 80	....	....	
neglectus *Lea.* (Aug. 18, 1843.)	IV. 38	....	....	
Neislerii *Lea.* (July 6, 1858.)	VII. 30	VII. 31	....	
Neusensis *Lea.*. (Mar. 23, 1858.)	VIII. 64	....	....	VII. 24: VIII. 13.
nigellus *Lea.* (Mar. 5, 1852.)	V. 39	X. 45	X. 45	VII. 14, 19.
nigerrimus *Lea.* (Mar. 5, 1852.)	V. 24	....	....	
nigrinus *Lea.* (Mar. 5, 1852.)	V. 40	....	....	
nitens *Lea.* (Oct. 2, 1840.)	III. 43	X. 42	X. 42	VI. 83: VIII. 95.
notatus *Lea.* (Feb. 5, 1836.)	II. 28	....	....	
Northamptonensis *Lea.* (Dec. 24, 1861.)	IX. 12	....	....	
Novi-Eboraci *Lea.* (Jan. 5, 1838.)	II. 104	X. 55	VI. 47 X. 55	VIII. 25, 32.
nucleopsis *Con.*	....	....	....	V. 37: VII. 38.
nux *Lea.* (Mar. 5, 1852.)	V. 39	X. 75	....	VIII. 62, 105.
obesus *Lea.* (May 7, 1830.)	I. 106	X. 40	....	I. 118, 151, 214: II. 129: VI. 75: XI. 26.
obfuscus *Lea.* (June 23, 1857.)	VII. 15	....	....	
oblatus *Lea.* (June 16, 1863.)	XI. 17	....	....	
obliquus *Lam.*	....	X. 77	....	I. 36, 200: III. 50: IV. 45: VII. 89: X. 77.
obnubilus *Lea.* (June 23, 1857.)	VI. 84	VI. 84	....	
obscurus *Lea.* (Dec. 19, 1834.)	II. 7	X. 78	....	III. 44: IV. 51: V. 28.
obtusus *Lea.* (Oct. 2, 1840.)	III. 39	X. 42	VI. 46 X. 43	
occidens *Lea.* (Mar. 6, 1829.)	I. 49	X. 54	VI. 47 X. 55	I. 23, 25, 129, 201: II. 104: III. 45: XI. 31.
occidentalis *Con.*	....	....	....	[Check List.]
occultus *Lea.* (Aug. 18, 1843.)	IV. 37	....	....	V. 29, 39, 40.
ochraceus *Say.* †	I. 69	X. 91	....	I. 25, 36, 200: II. 49, 51, 54, 57, 71: III. 54, 76: X. 91: XI. 63.
Ocmulgeensis *Lea.* (Feb. 5, 1861.)	VIII. 99	....	....	
opacus *Lea.* (June 23, 1857.)	VI. 86	....	....	VI. 85.
orbiculatus *Hild.*	....	X. 46	....	III. 69.
Oregonensis *Lea.* (Mar. 5, 1852.)	V. 31	....	....	VII. 74: IX. 35.
ornatus *Lea.* (Feb. 5, 1861.)	VIII. 89	....	....	VIII. 35.
Othcaloogensis *Lea.* (Feb. 17, 1857.)	VI. 74	VI. 74	VI. 74	

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* [U. soleniformis *Lea.* May 7, 1830.]

† [Symphynota ochracea *Lea.* Mar. 6, 1829.]

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
ovatus *Say.*		X. 71	VI. 47 X. 71	I. 5, 10, 23, 25, 31, 37, 50, 129, 201 : II. 55, 103 : III. 69 : V. 22 : VI. 72 : VII. 86.
oviformis *Con.*				III. 76, 80 : VIII. 90.
pallescens *Lea.* (May 2, 1845.)	IV. 53			VIII. 74.
palliatus *Ravenel.*				VIII. 37.
pallidofulvus *Lea.* (Mar. 5, 1861.)	VIII. 87			VIII. 89.
paludicolis *Gould.*				[Check List.]
papyraceus *Gould.*				[Check List.]
parvulus *Lea.* (July 3, 1860.)	XI. 49	XI. 49	XI. 49	
parvus *Barnes.*		VII. 39	VII. 39	I. 23, 26, 27, 34, 54, 97, 213 : II. 55, 128 : III. 52, 69, 70, 85 : IV. 35 : V. 18, 25 : VI. 20 : VIII. 44, 101 : IX. 27 : XI. 24, 31, 54.
patulus *Lea.* (Mar. 6, 1829.)	I. 55	X. 58		I. 23, 26, 103, 145, 186 : III. 69 : VII. 28 : VIII. 34.
paulus *Lea.* (Oct. 2, 1840.)	III. 51	X. 38	VII. 40 X. 39	VIII. 26.
pauperculus *Lea.* (Feb. 5, 1861.)	VIII. 103			
pectorosus *Con.*				[Check List.]
pellucidus *Lea.* (May 2, 1845.)	IV. 44			IV. 44.
penicillatus *Lea.* (June 23, 1857.)	VII. 21	VII. 21	VI. 47 VII. 22	
penitus *Con.*		X. 76		II. 124 : VII. 37.
percoarctatus *Lea.* (Mar. 10, 1857.)	VIII. 63			VIII. 62, 92 : IX. 23.
perdix *Lea.* (Mar. 15, 1833.)	I. 184			I. 186 : III. 36.
perlatus *Lea.* (June 16, 1863.)	XI. 19			XI. 20.
perlucens *Lea.* (June 16, 1863.)	XI. 22			
permiscens *Lea.* (April 5, 1859.)	VIII. 106	VIII. 106		
pernodosus *Lea.* (May 2, 1845.)	IV. 45			
perovalis *Con.*				[Check List.]
perovatus *Con.*				VIII. 94.
perpastus *Lea.* (Mar. 5, 1861.)	VIII. 73			
perpictus *Lea.* July 3, 1860.)	VIII. 32			
perplexus *Lea.* (May 20, 1831.)	I. 122	X. 56	VI. 48 X. 56	I. 144 : II. 50, 95 : III. 32, 69 : VIII. 68 : IX. 15.
perplicatus *Con.*				[Check List.]
perpurpureus *Lea.* (Feb. 5, 1861.)	XI. 50			
perradiatus *Lea.* (Mar. 23, 1858.)	VIII. 70			
personatus *Say.* (Mar. 16, 1832.) *	I. 141	X. 78		III. 69.
perstriatus *Lea.* (Mar. 5, 1852.)	V. 11			VIII. 62.
pertenuis *Lea.* (June 16, 1863.)	XI. 12			
phaseolus *Hild.* †	I. 45	VII. 38 X. 80	VI. 47 VII. 17	II. 50 : III. 69, 78 : IV. 55 : VI. 86 : VII. 9, 18.
Phillipsii *Con.*				III. 22.
pictus *Lea.* (Mar. 15, 1833.)	I. 185			III. 82 : VIII. 33, 37.
pilaris *Lea.* (Oct. 2, 1840.)	III. 47			
pileus *Lea.* (May 20, 1831.)	I. 129			III. 69, 70.
pinguis *Lea.* (Mar. 24, 1857.)	VI. 78			
placitus *Lea.* (Mar. 5, 1852.)	V. 35			
plancus *Lea.* (July 3, 1860.)	VIII. 85	VIII. 85		
planicostatus *Lea.* (Mar. 20, 1860.)	VIII. 36			
Plantii *Lea.* (June 23, 1857.)	VII. 10	VII. 11		VII. 15 : XI. 25.
plenus *Lea.* (Oct. 2, 1840.)	III. 49			
plicatus *Lesueur.*		X. 67		I. 20, 23, 25, 26, 31, 35, 36, 75, 78, 79, 81, 116, 199 : II. 123 : III. 69, 70 : IV. 42.
Popeii *Lea.* (April 7, 1857.)	VIII. 54			VI. 36.
porphyreus *Lea.* (Mar. 5, 1861.)	VIII. 84			

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* [U. capillaris *Lea.* March 16, 1832.]

† [U. planulatus *Lea.* March 6, 1829.]

UNIO.	Description.	Soft Parts.	Embryo.	MISCELLANEOUS REFERENCES.
porrectus *Con.*	....		....	[Check List.]
Postellii *Lea.* (July 6, 1858.)	VII. 32	VII. 32	VIII. 32	
Powellii *Lea.* (Mar. 5, 1852.)	V. 26	....	....	
Prattii *Lea.* (July 6, 1858.)	VII. 24	VII. 24	VI. 47 VII. 25	XI. 12.
pressus *Lea.* *	I. 64	X. 59	VI. 48 X. 59	V. 13, 50.
Prevostianus *Lea.* (Mar. 5, 1852.)	V. 25	....	....	VII. 13, VIII. 32.
productus *Con.*	....	....	....	[Check List.]
propinquus *Lea.* (Mar. 24, 1857.)	VIII. 67	....	....	
proximus *Lea.* (Mar. 5, 1852.)	V. 27	....	....	VIII. 21.
pudicus *Lea.* (Mar. 20, 1860.)	VIII. 28	....	....	
pulcher *Lea.* (Dec. 19, 1834.)	II. 6	....	....	II. 16.
pullatus *Lea.* (Nov. 4, 1856.)	VI. 57	....	....	VI. 76: VIII. 11, 58.
pullus *Con.*	....	....	....	[Check List.]
pulvinulus *Lea.* (May 2, 1845.)	IV. 55	....	....	V. 35: VIII. 30, 62.
pumilus *Lea.* (Feb. 5, 1836.)	II. 23	....	....	
purpuratus *Lam.* †	I. 40	X. 72	X. 72	I. 36, 199: II. 49, 143: IV. 39: VI. 34, 35: VIII. 80, 106: XI. 31.
purpurellus *Lea.* (June 23, 1857.)	VIII. 16	VII. 16	....	
purpuriatus *Say.*	....	....	....	[Check List.]
purus *Lea.* (Mar. 23, 1858.)	VIII. 65	....	....	
pusillus *Lea.* (Oct. 2, 1840.)	III. 58	....	....	IV. 35: VIII. 23: XI. 14.
pustulatus *Lea.* (May 7, 1830.)	I. 89	X. 65	....	II. 73, 123: III. 69.
pustulosus *Lea.* (May 7, 1830.)	I. 86	X. 64	....	I. 74, 89, 173: II. 11: III. 69: V. 37: VIII. 73: IX. 28.
Pybasii *Lea.* (Mar. 23, 1858.)	VIII. 71	....	....	
pygmæus *Lea.* (Mar. 5, 1852.)	V. 18	....	....	
pyramidatus *Lea.* (May 20, 1831.)	I. 119	X. 69	....	I. 121: II. 13, 14: III. 51, 69.
pyriformis *Lea.* (Feb. 17, 1857.)	VI. 69	VI. 49	....	
quadrans *Lea.* (July 3, 1860.)	VIII. 42	....	....	
quadratus *Lea.* (June 21, 1859.)	VIII. 20	VIII. 21	....	
quadrilaterus *Lea.* (June 16, 1863.)	XI. 9	....	....	XI. 19.
radians *Lea.* (Feb. 17, 1857.)	VII. 19	VII. 20	VII. 20	VIII. 24.
radiatus *Lam.*	....	II. 52 X. 47	VI. 48 X. 48	I. 25, 29, 36, 83, 200: II. 14, 39, 54, 57: III. 37, 39, 72, 82: V. 17, 26: VI. 51, 76: VIII. 46: X. 38.
Raeensis *Lea.* (June 21, 1859.)	VIII. 13	....	....	
Raleighensis *Lea.* (June 16, 1863.)	XI. 10	....	....	XI. 11.
Rangianus *Lea.* (July 21, 1837.)	II. 95	X. 62	....	VIII. 68: IX. 15.
Ravenelianus *Lea.* (Mar. 16, 1832.)	I. 144	....	....	II. 42: III. 41, 74: V. 37: VII. 23: VIII. 31: IX. 29.
rectus *Lam.*	....	X. 62	VI. 47 X. 63	I. 20, 23, 25, 36, 37, 87, 138, 201: II. 55, 131: III. 69: V. 13: XI. 31.
Reeveianus *Lea.* (Mar. 5, 1852.)	V. 28	....	....	
regularis *Lea.* (June 18, 1841.)	III. 81	....	....	
retusus *Lam.*	....	X. 69	VI. 47 X. 69	I. 36: II. 55: III. 69.
Riddellii *Lea.* (Dec. 24, 1861.)	IX. 20	....	....	IX. 19.
Roanokensis *Lea.* (Feb. 5, 1836.)	II. 27	....	....	VII. 24: VIII. 65: IX. 25.
rostriformis *Lea.* (Nov. 4, 1856.)	VI. 64	VI. 65	....	VIII. 62: XI. 17.
rostrum *Lea.* (Dec. 24, 1861.)	IX. 23	....	....	
Roswellensis *Lea.* (July 6, 1858.)	VII. 23	VII. 24	....	VII. 33: VIII. 15.
rotundatus *Lam.* ‡	I. 142	....	....	I. 48: VIII. 105.
rubellinus *Lea.* (Feb. 17, 1857.)	VI. 70	VI. 70	VI. 71	VI. 51: Byssus VI. 70.
rubellus *Con.*	....	....	....	[Check List.]

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* [Symphynota compressa *Lea.* Mar. 6, 1829.]

† [U. ater *Lea.* Mar. 6, 1827.]

‡ [U. subglobosus *Lea.* Mar. 16, 1842.]

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UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
rubidus *Lea.* (Feb. 5, 1861.)	VIII. 99	VIII. 100	....	
rubiginosus *Lea.* (Mar. 6, 1829.)	I. 41	X. 52, 53	VI. 40 ova, X. 53	I. 23, 26, 27, 52, 143, 150: II. 32: III. 69, 70, 75: IV. 51: V. 31: VI. 51, 59: VII. 88: VIII. 29, 60, 70, 81, 100, 104: IX. 18: XI. 31.
rufus *Lea.* (June 23, 1857.)	VI. 85	VI. 85	....	
rufusculus *Lea.* (Mar. 5, 1852.)	V. 14	....	....	VI. 64, 85.
Rumphianus *Lea.* (Mar. 5, 1852.)	V. 32	....	....	VI. 66.
Rutersvillensis *Lea.* (May 10, 1859.)	VIII. 38	....	....	XI. 31.
rutilans *Lea.* (Nov. 4, 1856.)	VI. 59	VI. 60	VI. 46	VI. 63: VIII. 10.
sagittæformis *Lea.* (Mar. 5, 1852.)	V. 33	....	....	VI. 65, 68.
salebrosus *Lea.* (June 21, 1859.)	VIII. 14	VIII. 14	....	VIII. 18, 19, 20.
Sampsonii *Lea.* (Dec. 24, 1861.)	IX. 14	....	....	
Satillaensis *Lea.* (July 6, 1858.)	VII. 34	VII. 34	....	XI. 12.
satur *Lea.* (Mar. 5, 1852.)	V. 21	....	....	
Savannahensis *Lea.* (June 23, 1857.)	VI. 81	....	....	VIII. 12: XI. 22, 27.
Saxeus *Con.*	....	....	....	[Check List.]
Schoolcraftensis *Lea.* (Mar. 16, 1832.)	I. 149	....	....	V. 37: IX. 18.
scitulus *Lea.* (Mar. 20, 1860.)	VIII. 24	....	....	VIII. 32.
securis *Lea.* (Mar. 6, 1829.)	I. 51	X. 67	VI. 47 X. 68	I. 23, 25, 42: II. 55, 124: III. 69: X. 76.
Shepardianus *Lea.* (Feb. 7, 1834.)	I. 207	X. 51	....	II. 8, 38: IV. 38.
Showalterii *Lea.* (July 3, 1860.)	VIII. 77	VIII. 78	....	
similis *Lea.* (June 23, 1857.)	VI. 91	VI. 91	VI. 91	VII. 13.
simplex *Lea.* (May 2, 1845.)	IV. 50	....	....	IV. 47.
simus *Lea.* (Feb. 5, 1836.)	II. 26	....	....	VIII. 85.
Sloatianus *Lea.* (Oct. 2, 1840.)	III. 55	X. 44	....	
solidus *Lea.* (Dec. 19, 1834.)	II. 13	X. 65	....	VIII. 77: XI. 31.
sordidus *Lea.* (Mar. 5, 1852.)	V. 10	....	....	VIII. 14.
Sowerbyanus *Lea.* (Mar. 15, 1833.)	I. 180	....	....	I. 181.
spadiceus *Lea.* (Mar. 10, 1857.)	VIII. 59	....	....	VIII. 12.
sparsus *Lea.* (June 18, 1841.)	III. 80	....	....	V. 33.
spatulatus *Lea.* (May 2, 1845.)	IV. 54	X. 60	VI. 47 X. 60	
speciosus *Lea.* (April 22, 1862.)	IX. 29	....	....	
Spillmanii *Lea.* (Feb. 5, 1861.)	VIII. 102	....	....	
spinosus *Lea.* (July 15, 1836.)	II. 57	X. 49	....	II. 71: VII. 62.
spissus *Lea.* (April 5, 1859.)	VII. 26	....	....	
splendidus *Lea.* (Aug. 19, 1836)	II. 70	X. 50	....	
squalidus *Lea.* (June 16, 1863.)	XI. 26	....	....	
squameus *Lea.* (Dec. 24, 1861.)	IX. 22	....	....	
stabilis *Lea.* (Mar. 5, 1861.)	VIII. 75	....	....	
stagnalis *Con.*	....	....	....	[Check List.]
stapes *Lea.* (May 7, 1830.)	I. 87	....	....	
Stewardsonii *Lea.* (Mar. 5, 1852.)	V. 34	....	....	VIII. 69: XI. 52.
Stonensis *Lea.* (Oct. 2, 1840.)	III. 33	....	....	VI. 90: VII. 11.
stramineus *Con.*	....	VII. 41	....	III. 38: IV. 40, 53.
striatulus *Lea.* (Mar. 10, 1857.)	VIII. 59	X. 57	....	
striatus *Lea.* (Oct. 2, 1840.)	III. 41	X. 54	....	VIII. 86.
strigosus *Lea.* (Oct. 2, 1840.)	III. 36	X. 47	....	VII. 33.
subangulatus *Lea.* (Oct. 2, 1840.)	III. 47	X. 44	ova, VI. 50; emb., X. 45	
subellipsis *Lea.* (Nov. 4, 1856.)	VI. 62	VI. 63	....	VI. 67, 77: VIII. 10.
subflavus *Lea.* (June 23, 1857.)	VI. 90	VI. 90	....	VII. 15: XI. 27.
subgibbosus *Lea.* (June 23, 1857.)	VI. 53	X. 79	....	IX. 26.
subinflatus *Con.*	....	....	....	[Check List.]
sublatus *Lea.* (June 23, 1857.)	VI. 82	VI. 82	VI. 83	
subniger *Lea.* (June 23, 1857.)	VII. 14	VII. 14	....	

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
subovatus *Lea.* (May 20, 1831.)	I. 128			II. 125.
subrotundus *Lea.* (May 20, 1831.)	I. 127	X. 53, 63	ova, X. 53	I. 147, 211 : III. 34, 48.
subtentus *Say.*				I. 23, 26, 175 : III. 40.
succissus *Lea.* (Mar. 5, 1852.)	V. 31			
sudus *Lea.* (June 23, 1857.)	VII. 12	VII. 12	VII. 12	
sulcatus *Lea.* (Mar. 6, 1829.) *	I. 44	X. 78	X. 78	I. 23, 25, 127, 130, 147, 148 : II. 50, 126 : III. 69, 70.
symmetricus *Lea.* (May 2, 1845.)	IV. 47			VI. 76.
tæniatus *Con.*				[Check List.]
Taitianus *Lea.* (Mar. 16, 1832.)	I. 151			
Tappanianus *Lea.* (July 15, 1836.)	II. 62			II. 75.
tenebricus *Lea.* (June 23, 1857.)	VI. 83	VI. 83		
tener *Lea.* (Oct. 2, 1840.)	III. 36			VIII. 35.
tenerus *Ravenel.*		X. 51		
Tennesseensis *Lea.* (Oct. 2, 1840.)	III. 37			
tenuissimus *Lea.* †	I. 67	X. 77		III. 69.
tesserulæ *Lea.* (Dec. 24, 1861.)	XI. 44			
tetralasmus *Say.*				II. 129 : IV. 48.
tetricus *Lea.* (June 23, 1857.)	VII. 13	VII. 13		VII. 17.
Texasensis *Lea.* (Mar. 24, 1857.)	VIII. 41			VIII. 39 : IX. 27.
Thorntonii *Lea.* (Mar. 24, 1857.)	XI. 42			XI. 43, 44.
tortivus *Lea.* (Oct. 2, 1840.)	III. 42	X. 45	X. 45	VII. 14, 17.
trapezoides *Lea.* (May 7, 1830.)	I. 79	X. 72		I. 199 : II. 125 : VI. 35 : VIII. 65.
triangularis *Bar.* ‡	I. 121	X. 56, 84	VI. 48 X. 57	I. 5, 6, 20, 23, 26, 86, 122, 126, 137 : II. 50, 55, 72, 124, 125 : III. 69 : XI. 21.
trigonus *Lea.* (May 20, 1831.)	I. 120	X. 64		I. 121, 181 : II. 55, 73, 125 : III. 50, 69 : IV. 45 : VIII. 95 : IX. 18, 21.
trinacrus *Lea.* (Mar. 5, 1861.)	VIII. 90			
Troostii *Lea.* (Mar. 15, 1833.)	I. 183			XI. 51.
Troschelianus *Lea.* (Mar. 5, 1852.)	V. 36			VII. 38.
trossulus *Lea.* (Aug. 18, 1843.)	IV. 36			
tuberculatus *Barnes.*		X. 61		I. 23, 24, 26, 44, 74, 75, 81, 96 : II. 56 : III. 69 : XI. 31.
tuberosus *Lea.* (Oct. 2, 1840.)	III. 48			III. 81 : V. 33.
tumescens *Lea.* (May 2, 1845.)	IV. 45			IV. 47.
Tuomeyi *Lea.* (Mar. 5, 1852.)	V. 12	X. 80		V. 13 : VI. 61, 80 : VIII. 11 : XI. 25.
turgidulus *Lea.* (Mar. 23, 1858)	VIII. 66			IX. 15.
turgidus *Lea.* (Dec. 19, 1834.)	II. 11			
umbrans *Lea.* (Feb. 17, 1857)	VI. 72	VI. 73	VI. 73	VIII. 84. [Changed from *umbrosus*, preoccupied, Nov. 23, 1858.]
undulatus *Bar.*		X. 53	VI. 48 X. 53	I. 35, 78 : II. 124 : IV. 42, 44 : XI. 31.
unicolor *Lea.* (May 2, 1845.)	IV. 48			
utriculus *Lea.* (May 2, 1845.)	IV. 43			
Vanuxemii *Lea.* (Feb. 5, 1836.)	II. 36			II. 28 : IV. 36, 43 : VI. 83 : VIII. 71 : XI. 51.
varicosus *Lea.* (May 7, 1830.)	I. 100			I. 117 : II. 124 : III. 69.
Vaughanianus *Lea.* (Dec. 19, 1834.)	II. 5			
velatus *Con.*				[Check List.]
ventricosus *Barnes.*		VII. 42		I. 23, 25, 33, 50, 129 : II. 125.
venustus *Lea.* (Dec. 19, 1834.)	II. 4			VIII. 51.
verrucosus *Barnes.*		X. 63		I. 23, 24, 26, 27, 87, 89, 173 : II. 70 : III. 69 : IV. 46.
verus *Lea.* (Feb. 5, 1861.)	VIII. 87			
verutus *Lea.* (June 21, 1859.)	VIII. 17			VIII. 99.

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* [U. ridibundus *Say.* Female.]

† [Symphynota tenuissima *Lea.* March 6, 1829.]

‡ [U. formosus *Lea.* May 20, 1831.]

UNIO.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
vestitus *Lea.* (Dec. 24, 1861.)	IX. 11			
vicinus *Lea.* (Nov. 4, 1856.)	VI. 61	VI. 62		VII. 34.
virens *Lea.* (June 23, 1857.)	VI. 80			
virescens *Lea.* (Mar. 23, 1858.)	VIII. 23			
viridans *Lea.* (June 21, 1859.)	VIII. 19			
viridicatus *Lea.* (June 23, 1857.)	VI. 87	VI. 87		
viridiradiatus *Lea.* (May 10, 1859.)	VIII. 18			IX. 32.
viridulus *Lea.* (June 16, 1863.)	XI. 14			
Waccamawensis *Lea.* (June 16, 1863.)	XI. 20			
Wardii *Lea.* (Dec. 24, 1861.)	IX. 9			
Watereensis *Lea.*				II. 130.
Weldonensis *Lea.* (June 16, 1863.)	XI. 15			
Whiteianus *Lea.* (Mar. 5, 1852.)	V. 14			VI. 91 : IX. 22.
Woodwardianus *Lea.* (June 23, 1857.)	VII. 17	VII. 17 X. 80	VI. 45, 47 VII. 18	VII. 9, 37 : VIII. 91.
Zeiglerianus *Lea.* (Feb. 5, 1836.)	II. 32			
zigzag *Lea.* (Mar. 6, 1829.)	I. 54	X. 66		I. 23, 25, 26, 92, 94 : II. 124 : VIII. 51.
MARGARITANA.				
Alabamensis *Lea.* (Feb. 5, 1861.)	VIII. 108			
arcula *Lea.* (Aug. 19, 1836.)	II. 71	X. 83		
calceola *Lea.* (Nov. 2, 1827.)	I. 7			II. 135, 143 : III. 69.
complanata (**ALAS.**) *Barnes*.*	I. 62	X. 84	VI. 49 X. 85	III. 69 : IX. 37 : XI. 31.
confragosa (**ALAS.**) *Say*		X. 84		
Connasaugaensis *Lea.* (June 22, 1858.)	VII. 47			
Curreyana *Lea.* (Oct. 2, 1840.)	III. 61			
dehiscens (**UNIO**) *Say*.†	I. 83	X. 76		
deltoidea *Lea.* (Feb. 5, 1836.)	II. 43	X. 84	VI. 49 X. 84	IV. 57.
Elliottii *Lea.* (June 22, 1858.)	VII. 44	VII. 44		VIII. 110, 111 : IX. 34.
elliptica *Lea.* (April 5, 1859.)	VIII. 110	VIII. 111		
Etowahensis *Con.*				
fabula *Lea.* (Feb. 5, 1836.)	II. 44			
Georgiana *Lea*.‡	VII. 45			
Gesnerii *Lea.* (June 22, 1858.)	IX. 33			
Hildrethianus *Lea*.§	I. 148	X. 83	VI. 49 X. 83	
Holstonia *Lea.* (Feb. 5, 1836.)	II. 42			VII. 45 : IX. 32.
margaritifera (**MYA**) *Lin.*		VII. 42		II. 56, 97 : IV. 53 : XI. 67, 111.
marginata (**ALAS.**) *Say*		X. 82	VI. 49 X. 82, 83	II. 54, 56, 97, 135 : IV. 39 : VII. 44 : XI. 31.
minor *Lea.* (May 2, 1845.)	IV. 56			
quadrata *Lea.* (Feb. 5, 1861.)	IX. 32			

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* [Symph. complanata *Lea.* Mar. 6, 1829.]

† [Unio oriens *Lea.* May 7, 1830.]

‡ [Marg. Etowahensis *Lea.* Preoccupied June 22, 1858; changed to Georgiana Oct. 18, 1859.]

§ [Unio Hildrethianus *Lea.* Mar. 16, 1832.]

MARGARITANA.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
radiata (**ALAS.**) *Con.*				II. 135.
Raveneliana *Lea.* (Feb. 7, 1834.)	I. 218			II. 42.
rugosa (**ALAS.**) *Barnes*		X. 82	VI. 44, 45, 48: X. 82, 83	III. 45, 69.
Spillmanii *Lea.* (June 22, 1858.)	VIII. 109	VIII. 109	VIII. 110	
Tombigbeensis *Lea.* (June 22, 1858.)	VIII. 111	VIII. 112		
triangulata *Lea.* (June 22, 1858.)	VII. 46	VII. 46	VI. 49 VII. 47	
undulata (**ALAS.**) *Say*				II. 54, 55, 56.
ANODONTA.				
angulata *Lea.* (July 21, 1837.)	II. 97			III. 84: XI. 111.
argentea *Lea.* (Oct. 2, 1840.)	III. 61			
Arkansensis *Lea.* (Mar. 5, 1852.)	V. 49			
Bealei *Lea.* (June 16, 1863.)	XI. 30			
Benedictii *Lea.**	I. 216			II. 77, 87: XI. 30, 32.
Buchanensis *Lea.* (Feb. 5, 1834.)	II. 47			
Californiensis *Lea.* (Mar. 5, 1852.)	V. 42			
Couperiana *Lea.* (Oct. 2, 1840.)	III. 65	X. 87	X. 87	III. 87.
cultrata *Gould*				[Check List.]
Dallasiana *Lea.* (June 16, 1863.)	XI. 33			
Danielsii *Lea.* (June 22, 1858.)	VIII. 47			
Dariensis *Lea.* (June 22, 1858.)	VII. 48	VII. 48	VII. 49	
decora *Lea.* (July 15, 1836.)	II. 64	X. 88	VI. 49 X. 88	III. 62: VIII. 48, 49: IX. 35.
denigrata *Lea.* (Mar. 5, 1852.)	V. 41			V. 46.
doliaris *Lea.* (June 16, 1863.)	XI. 28			X. 29.
Dunlapiana *Lea.* (Oct. 21, 1842.)	III. 86			VII. 50: VIII. 56.
edentula (**ALAS.**) *Say*		X. 89	VI. 50	II. 55, 56: III. 69: IV. 56: V. 45: VIII. 111: XI. 31.
fragilis *Lam.*		X. 91		I. 205: II. 96: III. 64: VIII. 46, 114.
ferruginea *Lea.* (Oct. 2, 1840.)	III. 63			
Ferussaciana *Lea.* (Mar. 16, 1832.)	I. 157	X. 87	VI. 50 X. 87	I. 158: II. 46, 55, 56, 79, 106: III. 62, 69: V. 41: VII. 44: VIII. 47, 114: IX. 35.
fluviatilis (**MYTILUS**) *Solander*		II. 51		II. 52, 54, 80: III. 59, 87: V. 42: VI. 37: VII. 50: VIII. 45: IX. 35, 38: X. 91: XI. 32, 33.
Footiana *Lea.* (Oct 2, 1840.)	III. 63			VIII. 46: XI. 30.
Gesnerii *Lea.* (June 22, 1858.)	VII. 49			VII. 50: XI. 30.
gibbosa *Say*				I. 57, 159: III. 64, 65, 79: VIII. 110.
gigantea *Lea.* (Dec. 19, 1834.)	II. 1	X. 90		XI. 29.
grandis *Say*				[Check List.]
Hallenbeckii *Lea.* (June 22, 1858.)	VII. 50			
Harpethensis *Lea.* (Oct. 2, 1840.)	III. 62			

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* [Symph. Benedictensis *Lea.* Feb. 7, 1834.]

ANODONTA.	Description.	Soft Parts.	Embryo.	Miscellaneous References.
imbecillis *Say*.*	I. 158	X. 85	VI. 50 X. 86	VI. 51 : X. 45.
implicata *Say*				XI. 32, 33.
Kennerlyi *Lea*. (July 3, 1860.)	VIII. 112	VIII. 113		
Kennicottii *Lea*. (Feb. 12, 1861.)	IX. 36			IX. 35 : XI. 34.
lacustris *Lea*. (Mar. 24, 1857.)	VIII. 45	VIII. 46	VIII. 46	
Leonensis *Lea*. (April 22, 1862.)	XI. 29			
Lewisii *Lea*. (Mar. 24, 1857.)	VIII. 44	VIII. 45	VI. 49 VIII. 45	
Linnæana *Lea*. (Mar. 5, 1852.)	V. 45			V. 47.
lugubris *Say*				[Check List.]
Marryatana *Lea*. (Oct. 2, 1840.)	III. 64			
modesta *Lea*. (Mar. 24, 1857.)	VIII. 46			
Nuttalliana *Lea*. (Nov. 4, 1836.)	II. 77			II. 78 : V. 42, 43.
oblita *Lea*. (Mar. 5, 1852.)	V. 46			
opaca *Lea*. (Mar. 5, 1852.)	V. 41			
Oregonensis *Lea*. (Nov. 4, 1836.)	II. 80	X. 90	X. 90	
ovata *Lea*. (Dec. 19, 1834.)	II. 2	X. 88	VI. 49 X. 89	
papyracea *Anth*.				[Check List.]
pavonia *Lea*. (Nov. 4, 1836.)	II. 78			III. 38.
Pepiniana *Lea*. (July 21, 1837.)	II. 96			IX. 36.
plana *Lea*. (Mar. 16, 1832.)	I. 160	X. 88	X. 88	II. 64 : III. 69.
plicata *Hald*.				[Check List.]
salmonia *Lea*. (Feb. 5, 1836.)	II. 45			
Shafferiana *Lea*. (Mar. 5, 1852.)	V. 44			
Showalterii *Lea*. (July 3, 1860.)	IX. 37	IX. 37	IX. 38	
Simpsoniana *Lea*. (Feb. 12, 1861.)	IX. 34			
Stewartiana *Lea*. (Mar. 16, 1832.)	I. 159			II. 64 : V. 47 : XI. 30.
subcylindracea *Lea*. (Jan. 5, 1838.)	II. 106	X. 85	X. 85	VIII. 48.
suborbiculata *Say*.				III. 79.
subvexa *Con*.				[Check List.]
tetragona *Lea*. (May 2, 1845.)	IV. 56			V. 43, 45 : XI. 29.
Texasensis *Lea*. (April 5, 1859.)	VIII. 48			
Tryonii *Lea*. (April 22, 1862.)	XI. 32			
undulata *Say*		X. 86, 89	VI. 46, 50 X. 86	I. 39, 205 : II. 51, 52, 54, 55 : III. 63 : VIII. 111 : IX. 38.
virens *Lea*. (Mar. 5, 1852.)	V. 46			
virgulata *Lea*. (Mar. 10, 1857)	IX. 35			
Wahlamatensis *Lea*. (Nov. 4, 1836.)	II. 78	X. 89	X. 90	XI. 111.
Wardiana *Lea*. (Feb. 5, 1836.)	II. 46			III. 69.
Williamsii *Lea*. (April 22, 1862.)	XI. 31			XI. 31, 32, 33.

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* [An. incerta *Lea*. Mar. 6, 1829.]

SECTION II.

UNIONIDÆ OF MEXICO AND CENTRAL AMERICA.

SUBSECTIONS { UNIO.
ANODONTA.

UNIO.	Description.	MISCELLANEOUS REFERENCES.
aratus *Lea.* (Aug. 18, 1843.)	IV. 40	VI. 33: VII. 68, 71, 83.
Averyi *Lea.* (Oct. 18, 1859.)	VII. 87	
Aztecorum *Phili.*		[Check List.]
Berlandierii *Lea.* (April 7, 1857.)	VIII. 51	Soft parts, VIII. 51:..VIII. 43.
Caldwellii *Lea.* (May 18, 1858.)	VII. 83	
carboniferus Lea. (Feb. 5, 1836.)	II. 37	[Is preoccupied, and is a synonym of pliciferus *Lea.*]
cognatus *Lea.* (July 3, 1860.)	VIII. 50	
Couchianus *Lea.* (July 3, 1860.)	VIII. 53	
cuprinus *Lea.* (May 7, 1830.)	I. 104	I. 218: II. 133: V. 40: XI. 78.
cyrenoides *Phili.*		VII. 87.
discus *Lea.* (Nov. 4, 1836.)	II. 74	III. 72.
Dysonii *Lea.* (April 19, 1859.)	VII. 70	
Goascoranensis *Lea.* (May 18, 1858.)	VII. 76	VII. 46.
Liebmannii *Phili.*		[Check List.]
manubius *Gould.*		VI. 53.
Medellinus *Lea.* (Feb. 5, 1836.)	II. 39	III. 39.
Mexicanus *Phili.*		VII. 72.
Newcombianus *Lea.* (May 13, 1856.)	VI. 32	
Nicklinianus *Lea.* (Mar. 16, 1832.)	I. 140	III. 46, 72: VI. 15: VIII. 50.
persulcatus *Lea.* (April 19, 1859.)	VII. 73	
petrinus *Gould.*		VIII. 41, 54, 104.
pliciferus *Lea.* (July 15, 1836.)	II. 61	III. 73.
Poeyanus *Lea.* (Mar. 24, 1857.)	VI. 35	VIII. 55.
Rowellii *Lea.* (April 19, 1859.)	VII. 74	
Saladoensis *Lea.* (July 3, 1860.)	VIII. 52	
Sapotalensis *Lea.* (Feb. 19, 1841.)	III. 71	V. 32.
Scamnatus *Morelet.*		Soft parts, VII. 77:..VI. 22: VII. 85.
semigranosus *Vondembusch.*		[Check List.]
Tabascoensis *Lea.*		[Check List.]
Tampicoensis *Lea.* (Feb. 5, 1836.)	II. 24	VI. 31, 35.

UNIO.	Description.	Miscellaneous References.
Tecomatensis *Lea.* (Feb. 19, 1841.)...	III. 72	VIII. 52.
umbrosus *Lea.* (April 15, 1856.)......	VI. 31	VII. 64.
ANODONTA.		
cylindracea *Lea.*	II. 45	
glauca *Val.*	....	[Check List.]
globosa *Lea.*	III. 79	V. 45.
Henryana *Lea.*	VIII. 55	Soft parts, VIII. 55; embryo, VIII. 56.
Holtonis *Lea.*	VI. 36	
luteola *Lea.*	VII. 85	
Montezuma *Lea.*	III. 78	
Nicaragua *Phili.*	....	[Check List.]

inaequivalva Lea XII 52

SECTION III.

EXOTIC UNIONIDÆ.

SUBSECTIONS
TRIQUETRA,
PRISODON,
UNIO,
MARGARITANA,
PLAGIODON,
MONOCONDYLŒA,

SUBSECTIONS
DIPSAS,
ANODONTA,
IRIDINA,
SPATHA,
MYCETOPUS,

TRIQUETRA.	Description.	MISCELLANEOUS REFERENCES.
Browniana (UNIO) *Lea.* (Jan.19,1838.)	II. 108	
contorta *Lea.*	VI. 39	
lanceolata *Lea.* (April 1, 1856.) *		VI. 39, 41.
subviridis *Klein.*		VI. 40.
PRISODON.		
nodulosa *Wood.*		IX. 28.
truncatus *Schum.*		X. 13.
UNIO.		
Æthiops *Lea.* (Mar. 13, 1860.)	X. 13	
Afferulus *Lea.* (April 12, 1864.)	XI. 38	
Africanus *Lea.* (April 15, 1856.)	VI. 20	XI. 64.
Bengalensis *Lea.* (Dec. 19, 1834.)	II. 3	VII. 58.
bilineatus *Lea.* †	I. 108	
Bourguignatianus *Lea.* (June 16, 1863.)	XI. 58	XI. 55.
Brownii *Lea.* (April 15, 1856.)	VI. 27	VII. 70.
bulloides *Lea.* (July 5, 1859.)	VII. 82	
Burroughiana *Lea.* (Mar. 15, 1833.)	I. 179	I. 173 : VI. 28 : VII. 90 : IX. 12 : X. 23.
Cambodiensis *Lea.* (May 13, 1856.)	VI. 33	VII. 67.
cæruleus *Lea.* (May 7, 1830.)	I. 105	I. 102, 109 : VI. 14, 20, 23.
consobrinus *Lea.* (Dec. 6, 1859.)	VII. 90	VII. 91.
Corrianus *Lea.* (Mar. 15, 1833.)	I. 177	II. 19 : III. 60.

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* [Changed to contorta. Dec. 16, 1856.]

† [Symphynota bilineata *Lea.* May 7, 1830.]

UNIO.	Description.	Miscellaneous References.
cucumoides *Lea.* (Oct. 2, 1840.)	III. 30	III. 57 : IV. 35.
Cummingii *Lea.* (1850.)	VII. 58	
Damascensis *Lea.* (June 16, 1863.)	XI. 59	XI. 60.
delicatus *Lea.* (June 16, 1863.)	XI. 62	
delphinus *Lea.* (Oct. 2, 1840.)	III. 56	IV. 39 : VI. 11 : XI. 39.
Demararaensis *Lea.* (April 19, 1859.)	VII. 71	
dignatus *Lea.* (June 16, 1863.)	XI. 55	XI. 59.
disculus *Lea.* (Mar. 13, 1860.)	X. 21	
diminutus *Lea.* (April 19, 1859.)	VII. 72	
divaricatus *Lea.* (Mar. 15, 1833.)	I. 176	
Dunkerianus *Lea.* (April 15, 1856.)	VI. 25	
effulgens *Lea.* (April 15, 1856.)	VI. 23	
emarginatus *Lea.* (Mar. 15, 1833.)	I. 174	II. 33.
eximius *Lea.* (April 15, 1856.)	VI. 14	
firmus Lea	XII 27	
fluctiger *Lea.* (April 19, 1859.)	VII. 68	XI. 64.
funebralis *Lea.* (Mar. 13, 1860.)	X. 14	X. 17.
gratus *Lea.* (Mar. 13, 1860.)	X. 18	
gravidus *Lea.* (April 15, 1856.)	VI. 12	
Grayanus *Lea.* (Mar. 15, 1833.)	I. 178	II. 8.
Hainesianus *Lea.* (April 15, 1856.)	VI. 9	
Housei *Lea.* (April 15, 1856.)	VI. 11	VI. 10.
humilis *Lea.* (April 15, 1856.)	VI. 16	
incurvus *Lea.* (May 7, 1830.) *	I. 107	
Ingallsianus *Lea.* (Mar. 5, 1852.)	V. 38	VI. 18, 20 : XI. 66.
inornatus *Lea.* (April 15, 1856.)	VI. 13	VI. 20 : VII. 75.
Japanensis *Lea.* (April 19, 1859.)	VII. 62	
Javanus *Lea.* (Oct. 2, 1840.)	III. 58	VI. 14 : VII. 57.
Kirkii *Lea.* (April 12, 1864.)	XI. 36	XI. 38.
lacteolus *Lea.* (Mar. 16, 1832.)	I. 152	I. 173, 180 : III. 38.
lamellatus *Lea.* (Jan. 2, 1835.)	II. 19	VII. 62, 91 : XI. 27.
Laosensis *Lea.* (July 21, 1863.)	XI. 67	
Layardii *Lea.* (April 19, 1859.)	VII. 61	VII. 91.
lepidior *Lea.* (Mar. 13, 1860.)	X. 25	[Changed from *lepidus*—preoccupied.]
luteus *Lea.* (April 15, 1856.)	VI. 11	
Mauritianus *Lea.* (April 19, 1859.)	VII. 75	VII. 67.
melleus *Lea.* (April 19, 1859.)	VII. 68	
Mousulensis *Lea.* (June 16, 1863.)	XI. 56	XI. 55.
multistriatus *Lea.* (May 7, 1830.)	I. 101	IV. 52.
Murchisonianus *Lea.* (Mar. 16, 1832.)	I. 145	VI. 14 : VII. 61.
mutabilis *Lea.* (April 19, 1859.)	VII. 66	
Myersianus *Lea.* (April 15, 1856.)	VI. 10	XI. 67.
Nagpoorensis *Lea.* (Dec. 6, 1859.)	VII. 88	
Natalensis *Lea.* (April 19, 1864.)	XI. 63	
navigioliformis *Lea.* (April 19, 1859.)	VII. 63	
nocturnus *Lea.* (Mar. 13, 1860.)	X. 16	X. 21.
nucleus *Lea.* (April 15, 1856.)	VI. 26	VI. 17, 20.
Nuttallianus *Lea.* (May 13, 1856.)	VI. 30	

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* [U. littoralis *Drap.* Synopsis, 1852.]

UNIO.	Description.	Miscellaneous References.
Nyassaensis *Lea.* (April 12, 1864.)	XI. 37	XI. 39.
occatus *Lea.* (July 3, 1860.)	X. 34	
olivarius *Lea.* (May 20, 1831.)	I. 118	VI. 31.
orientalis *Lea.* (Oct. 2, 1840.)	III. 59	
Orontesensis *Lea.* (June 16, 1863.)	XI. 57	XI. 60.
	XII 31	
parallelopipedon *Lea.* (Mar. 15, 1833.)	I. 172	VII. 63 : X. 13, 14, 23.
Paramattensis *Lea.* (April 22, 1862.)	XI. 64	
Paranensis *Lea.* (Feb. 7, 1834.)	I. 211	II. 131, 143 : VI. 9, 28, 29 : VII. 83 : X. 13, 15, 20, 21, 22.
patelloides *Lea.* (Mar. 13, 1860.)	X. 19	
Pazii *Lea.* (April 22, 1862.)	XI. 65	
peræformis *Lea.* (Mar. 13, 1860.)	X. 20	
phaselus *Lea.* (April 15, 1856.)	VI. 17	VI. 19.
piceus *Lea.* (Mar. 13, 1860.)	X. 15	
piger *Lea.* (Mar. 13, 1860.)	X. 23	
plicatulus *Lea.* (April 19, 1859.)	VII. 65	
Rajahensis *Lea.* (Feb. 19, 1841.)	III. 77	XI. 36.
rasus *Lea.* (June 16, 1863.)	XI. 54	
rudus *Lea.* (July 5, 1859.)	VII. 84	
rusticus *Lea.* (April 15, 1856.)	VI. 14	VI. 16.
sagittarius *Lea.* (April 15, 1856.)	VI. 18	VII. 61.
scobinatus *Lea.* (April 15, 1856.)	VI. 19	VII. 69.
Shanghaiensis *Lea.* (April 19, 1859.)	VII. 60	
Shurtleffianus *Lea.* (April 15, 1856.)	VI. 22	X. 34.
Shuttleworthii *Lea.* (April 15, 1856.)	VI. 24	
Sikkemensis *Lea.* (April 19, 1859.)	VII. 69	
suavidicus *Lea.* (April 15, 1856.)	VI. 29	
substriatus *Lea.* (April 15, 1856.)	VI. 20	
Sumatrensis *Lea.* (April 19, 1859.)	VII. 57	XI. 67.
superbus *Lea.* (Aug. 18, 1843.)	IV. 39	VI. 9, 13.
Syriacus *Lea.* (June 16, 1863.)	XI. 60	
Thwaitesii *Lea.* (April 19, 1859.)	VII. 64	
tortilis *Lea.* (Mar. 5, 1852.)	V. 47	
trifidus *Lea.* (Mar. 13, 1860.)	X. 22	XI. 62.
tripartitus *Lea.* (June 16, 1863.)	XI. 61	
tumidulus *Lea.* (April 15, 1856.)	VI. 15	XI. 66.
Uruguayensis *Lea.* (Mar. 13, 1860.)	X. 24	X. 18, 24.
Verreauxianus *Lea.* (April 15, 1856.)	VI. 21	
vittatus *Lea.* (April 19, 1859.)	VII. 67	
Wheatleyianus *Lea.* (April 15, 1856.)	VI. 28	VII. 85, 90.
Wilsonii *Lea.* (April 19, 1859.)	VII. 74	XI. 65.
Wymanii *Lea.* (Mar. 13, 1860.)	X. 17	X. 25.
Wynegungaensis *Lea.* (Dec. 6, 1859.)	VII. 89	
MARGARITANA.		
Vondembuschiana *Lea.* (Oct. 2, 1840.)	III. 60	[Since changed to Monocondylœa Vondembuschiana.]
PLAGIODON.		
isocardioides *Lea.* (April 1, 1856.)	VII. 37	

MONOCONDYLŒA.	Description.	Miscellaneous References.
Bonelli *Fer.*		VII. 54: XI. 69.
compressa *Lea.* (June 16, 1863.)	XI. 34	
Cummingii *Lea.* (1850.)	VII. 53	VII. 80.
fossiculifera *D' Orb.*		III. 60.
Guarayana *D' Orb.*		VI. 38.
Mouhotii *Lea.* (July 21, 1863.)	XI. 69	
Paraguayana *D' Orb.*		VI. 39.
planulata *Lea.* (July 5, 1859.)	VII. 80	X. 36.
rhomboidea *Lea.* (July 5, 1859.)	VII. 81	
Schwerzenbackii *Bourg.*		XI. 58.
Saulcyi (**UNIO**) *Bourg.*		XI. 69.
Vescoi *Bourg.*		XI. 58.
Vondembuschiana (**MARG.**) *Lea.* *	III. 60	VII. 54.
Wheatleyi *Lea.* (April 23, 1862.)	X. 35	
DIPSAS.		
discoideus *Leach.* †	I. 187	II. 136.
plicatus *Leach.* ‡	I. 59	I. 61, 78: II. 136: VI. 40: VII. 50.
ANODONTA.		
Amazonensis *Lea.* (Mar. 13, 1860.)	X. 31	
Blainvilliana *Lea.* (Mar. 15, 1833.)	I. 189	II. 139, 140: X. 13, 30.
Burroughiana *Lea.* (Feb. 7, 1834.)	I. 217	
Calliaudii *Lea.* (July 3, 1860.)	X. 31	
crepera *Lea.* (1850.)	VII. 56	
cygnea *Lam.* §	I. 70	I. 109: VII. 50.
Dahomeyensis *Lea.* (April 19, 1859.)	VII. 79	
exilis *Lea.* (Nov. 4, 1836.)	II. 81	V. 49.
Forbesiana *Lea.* (Mar. 13, 1860.)	X. 29	X. 33.
gracilis *Lea.* (1850.)	VII. 57	
lato-marginata *Lea.* (Mar 15, 1833.)	I. 188	Soft parts, X. 30: II. 139: VII. 55: X. 13, 27.
magnifica *Lea.* (Mar. 16, 1832.)	I. 155	VI. 40.
Moricandii *Lea.* (Mar. 13, 1860.)	X. 32	

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* [Marg. Vondembuschiana *Lea.* Oct. 2, 1840.]

† [Symphynota discoidea *Lea.* Mar. 15, 1833]

‡ [Symph. bialata *Lea.* Mar. 6, 1829.]

§ [Symphynota cygnea *Lea.* Mar. 6, 1829.]

ANODONTA.	Description.	Miscellaneous References.
Mortoniana *Lea.* (Mar. 15, 1833.)	I. 192	
rubicunda *Lea.* (Mar. 13, 1860.)	X. 28	
Schroteriana *Lea.* (Mar. 5, 1852.)	V. 48	
Senegalensis *Lea.* (April 19, 1859.)	VII. 78	VII. 79.
subcrassa *Lea.* (1850.)	VII. 54	
tenebricosa *Lea.* (Mar. 15, 1833.)	I. 190	I. 188: II. 45: X. 13.
tenuis *Lea.* (1850.)	VII. 55	
Trautwiniana *Lea.* (Mar. 5, 1852.)	V. 43	VII. 85.
Uruguayensis *Lea.* (Mar. 13, 1860.)	X. 29	
Wheatleyi *Lea.* (Mar. 5, 1852.)	V. 43	X. 32.
Woodiana *Lea.* (Mar. 16, 1832.)	I. 154	
Wymanii *Lea.* (Mar. 13, 1860.)	X. 26	Soft parts, X. 27: X. 30.
IRIDINA.		
Clappertonii *Denman.*		I. 206.
cælestis *Lea.* (Nov. 4, 1836.)*	II. 82	
exotica *Lam.*		I. 206.
mutel *Adanson.*		II. 82.
Nilotica *Sow.*		I. 77, 206.
rubens *Lam.*		XI. 68.
SPATHA.		
alata *Lea.* (April 12, 1864.)	XI. 39	
cælestis (IRIDINA) *Lea.*†	II. 82	VI. 40: XI. 41.
modesta *Lea.* (April 12, 1864.)	XI. 41	
Natalensis *Lea.* (April 19, 1864.)	XI. 68	
Nyassaensis *Lea.* (April 12, 1864.)	XI. 40	
rubens (IRIDINA) *Lam.*		XI. 40, 68, 69.
MYCETOPUS.		
emarginatus *Lea.* (July 3, 1860.)	X. 34	
Siliquosus *D'Orb.*		X. 53.

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* [Since, Spatha cælestis *Lea.* q. v]

† [Iridina cælestis *Lea.* Nov. 4, 1836.]

SECTION IV.

UNIONIDÆ—SYNONYMS, SPECIES OF OTHER AUTHORS, AND OBSOLETE NOMENCLATURE.

SUBSECTIONS
ALASMODONTA,
ANODONTA,
ANODONTITES,
CASTALIA,
CHAMA,
CRISTARIA,
DIPLODON,

SUBSECTIONS
HYRIA,
MARGARITANA,
MYA,
MYTILUS,
SYMPHYNOTA,
UNIO.

ALASMODONTA.	Description	MISCELLANEOUS REFERENCES.
ambigua *Say*	....	II. 128.
arcuata *Barnes*	....	I. 175, 199, 200: II. 134.
Bonellii *Fer.*	....	VII. 54.
complanata *Barnes*	....	I. 63, 116, 140: II. 78.
edentula *Say*	....	II. 135: III. 60.
falcata *Gould*	....	VI. 42, 43: XI. 111.
margaritifera *Say*	....	I. 35.
marginata *Say*	....	I. 43, 77, 137, 203, 204, 219: II. 126, 135.
radiata *Con.*	....	II. 135.
rugosa *Barnes*	....	III. 45, 77.
truncata *Say*	....	II. 135.
undulata *Say*	....	I. 117: II. 72.
Yubaensis *Trask*	....	XI. 111.
ANODONTA.		
anatina *Lam.*	....	I. 204, 205: II. 137.
anserina *Spix*	....	X. 29, 33.
arcuata *Fer.*	....	VII. 54, 79.
areolatus *Swainson*	....	I. 57, 77: II. 47: III. 60: V. 45.
cataracta *Say*	....	I. 92, 158, 160: II. 2, 80.
Chaiziana *Rang*	....	II. 138: XI. 41.
compressa *Zeig.*	....	II. 137.

ANODONTA.	Description.	Miscellaneous References.
crassa *Swainson.*		I. 190 : II. 138.
crispata *Lam.*		I. 205 : V. 47, 48.
cygnea *Lam.*		I. 204, 205 : II. 81, 137.
cygnea, var. **ponderosa** *Pfr.*		VIII. 48.
elongatus *Swainson.*		I. 192.
ensiformis *Spix.*		V. 49.
esula *Jan.*		II. 140.
exotica *Lam.*		I. 190, 191, 205 : II. 139.
feminalis *Gould.*		XI. 111.
giganteus *Spix.*		I. 205 : II. 138.
glauca *Gould.*		V. 48.
glauca *Lam.*		I. 57.
glauca *Val.*		I. 206 : II. 138.
grossa *Zeigler.*		II. 137.
incerta *Lea.* (Mar. 16, 1832.)	I. 158	II. 47, 55 : III. 65, 69.
intermedia *Lam.*		I. 205.
Newtoniensis *Lea.* (May 7, 1830.)...*	II. 79	
obtusa *Spix.*		VII. 86.
obvoluta *Zeigler.*		II. 137.
pallida *Anth.*		X. 91.
Parishii *Gray.*		II. 139.
Patagonia *Lam.*		I. 189, 206 : II. 139.
Pennsylvanica *Lam.*		I. 205.
ponderosa *Pfr.*		II. 137.
porcifer *Gray.*		II. 139.
purpurascens *Swains.*		I. 68.
radiatus *Spix.*		VI. 37.
Randallii *Trask.*		XI. 111.
rotundatus *Spix.*		VIII, 43 : X. 13, 28, 31.
rotundata *Trask.*		XI. 111.
rubens *Lam.*		I. 205.
rugosa *Swainson.*		I. 39, 205.
sinuosa *Lam.*		I. 191, 206.
soleniformis *D'Orb.*		V. 49.
solidula *Deville.*		X. 32.
sulcata *Lam.*		I. 205.
trapezialis *Lam.*		I. 57, 205 : II. 138, 139 : V. 43 : X. 13, 29, 30, 33.
trapezius *Spix.*		II. 139.
triangularis *Trask.*		XI. 111.
trigona *Spix.*		II. 138.
uniopsis *Lam.*		I. 205.
ANODONTITES.		
cygnea *Poir.*		II. 138.

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* [An. implicata *Say.*]

CASTALIA.	Description.	Miscellaneous References.
ambigua *Lam.*		I. 57: X. 13.
CHAMA.		
plumbea *Mühlfeld.*		IX. 28.
CRISTARIA.		
tuberculata *Schum.*		I. 61.
DIPLODON.		
ellipticum *Spix.*		VI. 24.
rotundatum *Spix.*		VII. 83.
HYRIA.		
avicularis *Lam.*		I. 153.
corrugata *Lam.*		I. 204.
syrmatophora *Sowerby.*		II. 109.
MARGARITANA.		
Franciscana *Lea.*		II. 143.
fluviatilis *Schum.*		II. 135.
MYA.		
complanata *Solander.*		I. 30.
corrugatu maroccana *Chemn.*		II. 132.
crassissima *Klein.*		II. 134.
margaritifera *Lin.*		I. 35, 199: II. 134.
nodulosa *Wood.*		IX. 28.
ovalis *Solander.*		II. 128.
pictorum *Lin.*		I. 77.
pictorum *Forkaël.*		II. 129.
syrmatophora *Gron.*		I. 204.
variabilis *Mat.*		II. 131.
ventricosa *Sol.*		II. 133.

MYTILUS.	Description.	Miscellaneous References.	
angustior *List.*		II. 132.	
cygnea *Lin.*		I. 204.	
fluviatilis *Dill.*		I. 30.	
fluviatilis *Gmel.*		II. 137.	
fluviatilis *Solander.*		II. 138.	
radiatus *Mühl.*		II. 137.	
SYMPHYNOTA.			
alata *Lea.* (Mar. 6, 1829.)	I. 62	I. 59, 61, 77, 116, 138.	[U. alatus *Say.*]
Benedictensis *Lea.* (Feb. 7, 1834.)	I. 216		[An. Benedictensis *Lea.*]
bialata *Lea.* (Mar. 6, 1829.)	I. 59	I. 78, 187, 217: II. 3, 136.	[Dipsas plicatus *Leach.*]
bilineata *Lea.* (May 7, 1830.)	I. 108		[U. bilineatus *Lea.*]
compressa *Lea.* (Mar. 6, 1829.)	I. 64	I. 43, 77, 137: V. 13, 50.	[U. pressus *Lea.*]
cygnea *Lam.* (Mar. 6, 1829.)	I. 70	I. 109.	[An. cygnea *Lam.*]
complanata *Bar.* (Mar. 6, 1829.)	I. 62	I. 116, 140: II. 55.	[Marg. complanata *Bar.*]
discoidea *Leach.* (Mar. 15, 1833.)	I. 187	II. 3.	[Dipsas discoideus *Leach.*]
globosa *Lea.* (Mar. 16, 1832.)	I. 153		[U. capax *Green.*]
gracilis *Bar.* (Mar. 6, 1829.)	I. 66	I. 68: II. 55.	[U. gracilis *Barnes.*]
inflata *Lea.* (May 7, 1830.)	I. 109		[U. inflatus *Lea.*]
lævissima *Lea.* (Mar. 6, 1829.)	I. 58	I. 27, 78.	[U. lævissimus *Lea.*]
magnifica *Lea.* (Mar. 16, 1832.)	I. 155	I. 187.	[An. magnifica *Lea.*]
ochracea *Say.* (Mar. 6, 1829.)	I. 69	I. 109.	[U. ochraceus *Say.*]
tenuissima *Lea.* (Mar. 6, 1829.)	I. 67	I. 28: II. 131.	[U. tenuissimus *Lea.*]
Woodiana *Lea.* (Mar. 16, 1832.)	I. 154		[An. Woodiana *Lea.*]
UNIO.			
abruptus *Say.*		II. 127.	
alasmodontinus *Barnes.*		I. 65.	
alata *Lam.*		I. 62.	
alata *Swainson.*		I. 63.	
anas *Lam.*		I. 38.	
anodontina *Lam.*		I. 39, 204.	
ater *Lea.* (Mar. 6, 1829.)	I. 40	I. 23, 26, 199.	
auricularis *Spangler.*		II. 134.	
australis *Lam.*		I. 39, 204.	
Batavus *Lam.*		I. 38: IV. 34: VI. 21: XI. 57, 58, 61, 202.	
brevialis *Lam.*		I. 36, 200.	
Bruguierianus *Bourg.*		XI. 58.	
Caffer *Kraus.*		VI. 21, 22.	
Cailliaudii *Fer.*		V. 38: VI. 18.	

UNIO.	Description.	MISCELLANEOUS REFERENCES.
calceolus *Lea.* (Nov. 2, 1827.)	I. 7	I. 23, 25, 27, 34, 53, 77: II. 33, 43, 55.
capillaris *Lea.* (Mar. 16, 1832.)	I. 141	II. 50.
capillus *Say.*		II. 128.
carbonarius *Lea.* (Feb. 5, 1836.)	II. 37	[See pliciferus, II. 61.]
cardium *Raf.*		II. 124.
carinifera *Lam.*		I. 36, 200.
cariosa *Lam.*		I. 39, 204: II. 126.
"**cariosus** of the Ohio."		I. 136.
Charruanus *D' Orb.*		II. 128: VI. 29.
Childreni *Gray.*		II. 127.
cicatricosus *Say.*		II. 124.
coarctata *Lam.*		I. 36, 200.
compressus *Lea.* (Mar. 6, 1829.)	I. 64	III. 69.
crasissima *Klein.*		I. 198.
crassus *Barnes.*		I. 35.
crassus *Retzius*		I. 31, 79, 137: XI. 67.
crassus *Say.*		I. 185, 186: II. 4, 6, 16, 24, 40, 56, 76, 127: III. 69, 73: IV. 54.
cuneatus *Barnes.*		I. 23, 25, 33, 87, 199: II. 133: III. 69.
cyrenoides *Phili.*		VII. 87.
dehiscens *Say.*		II. 131: III. 69.
delodonta *Lam.*		I. 38, 152, 202: III. 38: V. 24: VI. 29: VII. 15, 85: X. 24, 25.
depressa *Raf.*		I. 23, 38, 51, 52, 203: II. 124.
Dombeyana *Val.*		I. 35.
Egyptiacus *Caill.*		II. 129.
ellipsaria *Raf.*		II. 124.
ellipsiformis *Con.*		IV. 54.
ellipticus *Spix.*		VI. 24: VII. 63.
elongata *Lam.*		I. 35, 199: II. 134.
excultus *Con.*		IV. 48.
faba *D' Orb.*		V. 17.
fasciata *Raf.*		II. 127.
favidens *Benson.*		VII. 89: VIII. 76, 86.
Fontainiana *D' Orb.*		X. 22.
formosus *Lea.* (May 20, 1831.)*	I. 121	I. 122: II. 50, 124: III. 69, 70, 86.
fragilis *Swainson.*		I. 66.
generosus *Gould.*		IX. 17.
geometricus *Lea.* (Mar. 16, 1832.)†	I. 150	II. 130.
Georgiana *Lam.*		I. 201.
giganteus *Spix.*		I. 31, 35.
glabrata *Lam.*		I. 37, 201.
glebulus *Say.* [1832.)‡		I. 201: II. 131.
globosus (**SYMPH.**) *Lea.* (Mar. 16,	I. 153	I. 33, 129: II. 104.
granosa *Lam.*		I. 38, 202, 203.
gratiosa *Phili.*		VI. 19, 23: VII. 69.
heros Say.		II. 122.
Hildrethianus *Lea.* (Mar. 16, 1832.)§	I. 148	I. 176: II. 128.
incurvus *Lea.* (May 7, 1830.)‖	I. 107	I. 202.
interruptus *Raf.*		II. 122.
interruptus *Say.*		II. 122.
Jordanicus *Bourg.*		XI. 57.

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* [See triangularis *Bar.*]

† [See declivis, *Say.*]

‡ [See capax *Green.*]

§ [See Marg. Hildrethiana *Lea.*]

‖ [U. littoralis *Drap.*]

UNIO.	Description.	Miscellaneous References.
Katherinæ *Lea.* *	II. 143	
Keraurdreni *Eydoux.*		VI. 31.
lacteolus *Lam.*		I. 202.
lapillus *Say.*		II. 128.
lata *Raf.*		II. 131.
lateralis *Raf.*		II. 125.
Leanus *Gray.*		I. 155.
lineolata *Raf.*		II. 124.
littoralis *Lam.*		I. 37, 200, 201, 202 : II. 137.
manca *Lam.*		I. 39, 203.
margaritifera *Drap.*		I. 37, 200.
marginalis *Lam.*		I. 39, 153, 178, 204, 209 : VII. 62.
membranacea *Lea.* †		II. 131.
metallicus *Say.*		II. 133.
modestus *Fer.*		II. 23 : VII. 72 : VIII. 27 : XI. 24.
modioliformis *Say.*		I. 201.
nana *Lam.*		I. 38, 202.
Napeanensis *Con.*		XI. 53.
nasuta *Lam.*		I. 37, 201.
naviformis *Lam.*		I. 37, 201.
nervosus *Raf.*		II. 124.
nexus *Say.*		II. 124.
Niloticus *Fer.*		II. 129.
nodulosa *Lam.*		I. 38, 202.
nodulosus *Wood.*		II. 123.
oriens *Lea.* (May 7, 1830.) ‡	I. 83	I. 78, 117, 149.
ovalis *Fleming.*		IV. 34.
ovalis *Lam.*		I. 37, 201.
ovata *Donovan.*		I. 202.
pachostea *Raf.*		II. 125.
Peruviana *Lam.*		I. 31, 35, 199.
pictorum *Lam.*		I. 9, 20, 28, 37, 77, 202, 203, 204 : II. 35, 132 : III. 60 : V. 23.
planilateris *Con.*		V. 14.
planulatus *Lea.* (Mar. 6, 1829.) §	I. 45	I. 23, 26, 52, 186, 214 : II. 56.
planus *Barnes.*		I. 66.
platyrhynchus *Ross.*		II. 132.
prælongus *Barnes.*		I. 32, 201.
prælongus *Hildreth.*		I. 32.
purpurascens *Lam.*		I. 36, 200.
purpureus *Say.*		I. 5, 22, 200 : II. 130.
Ravenelianus *Con.*		II. 126, 130.
Retzius *Nilss.*		XI. 57.
rhuocoica *D' Orb.*		VI. 26.
ridibundus *Say.*		I. 127, 147 : II. 126 : III. 69.
rotundata *Spix.*		I. 37, 38, 201 : II. 143 : X. 22.
ruber *Raf.*		II. 125.
rugosa *Poir.*		II. 134.
rugosus *Barnes.*		II. 123.
Sageri *Con.*		II. 131.
scalenia *Raf.*		I. 23, 26, 28, 56, 103, 151, 184, 201 : V. 35.

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* [Marg. complanata *Bar.*]

† [Myt. membranacea *Mat.*]

‡ [Marg. dehiscens *Say.*]

§ [U. phaseolus *Hildreth.*]

UNIO.	Description.	Miscellaneous References.
siliquoideus *Barnes.*		II. 15, 34, 127.
sintoxia *Raf.*		II. 125.
Smithii *Gray.*		II. 128.
soleniformis *Lea.* (May 7, 1830.) *	I. 97	I. 85, 116, 149 : II. 128.
subglobosus *Lea.* (Mar. 16, 1832.) †	I. 142	I. 201.
subrostratus *Say.*		II. 133.
Tavoyensis *Gould.*		VI. 12, 14.
Tigridis *Bourg.*		XI. 56.
Tigris *Fer.*		VI. 16 : XI. 56, 66.
torsa *Raf.*		I. 23, 26, 32, 48, 87, 200.
trapezialis *Lam.*		X. 23.
trapezium *Fer.*		II. 129.
truncatus *Raf.*		II. 124.
truncatus *Swainson.*		I. 103 : XI. 56.
undatus *Barnes.*		I. 119, 121, 128, 200 : II. 13, 125 : III. 54, 69.
undulata *Val.*		I. 35.
varicosa *Lam.*		I. 38, 117, 202, 203.
verrucosus albus *Hild.*		II. 123.
Virginiana *Lam.*		I. 39, 203.
violaceus *Spangler.*		II. 130.
viridis *Raf.*		II. 127.
vittata *Raf.*		II. 127.

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* [U. monodontus *Say.*]

† [U. rotundatus *Lam*]

SECTION V.

OPERCULATED AQUATIC UNIVALVES.

SUBSECTIONS
AMPULLARIA,
AMNICOLA,
ANCULOSA,
ANCULOTUS,
ASSIMINEA,
BASISTOMA,
BYTHINIA,
EURYCŒLON,
GONIOBASIS,
IO,
LITHASIA,
MELANIA,

SUBSECTIONS
MELANOPSIS,
MESESCHIZA,
NERITINA,
PACHYCHILUS,
PALUDINA,
PALUDOMUS,
RIVULINA,
SCHIZOSTOMA,
STREPHOBASIS,
TRYPANOSTOMA,
VALVATA.

AMPULLARIA.	Description.	MISCELLANEOUS REFERENCES.
aurostoma *Lea.* (June 3, 1856.)	XI. 71	
carinata *Caill.*		II. 90.
Celebensis *Quoy.*		XI. 70.
crassa *Swains.*		II. 16.
depressa *Say.*		I. 228.
fasciata *Lam.*		I. 228.
flagellata *Say.*		II. 70.
gracilis *Lea.* (June 3, 1856.)	XI. 70	
Hopetonensis *Lea.* (April 18, 1834.)	I. 227	
neritoides *D'Orb.*		XI. 112, 113.
ovata *Caill.*		XI. 71.
paludosa *Say.*		I. 228.
Pealiana *Lea.* (Dec. 19, 1834.)	II. 16	XI. 71.
tubæformis *Lea.* (June 3, 1856.)	XI. 70	
turbinis *Lea.* (June 3, 1856.)	XI. 70	
AMNICOLA.		
Currieriana *Lea.* (May 19, 1863.)	XI. 142	
isogona (**MEL.**) *Say.*		IV. 16.

AMNICOLA.	Description.	Miscellaneous References.
orbicula *Lea.* (Feb. 19, 1841.)	IV. 16	IV. 17.
parva *Lea.* (Feb. 19, 1841.)	IV. 16	
ANCULOSA.		
carinata *Lea.* (Feb. 19, 1841.)	IV. 15	
contorta *Lea.* (May 23, 1860.)	IX. 80	
Coosaensis *Lea.* (Feb. 19, 1861.)	IX. 79	IX. 80.
dissimilis *Say.*		IV. 15.
flammata *Lea.* (Dec. 16, 1842.)	IV. 30	
Foremanii *Lea.* (Dec. 16, 1842.)	IV. 29	
formosa *Lea.* (May 23, 1860.)	IX. 76	
gibbosa *Lea.* (Feb. 19, 1841)	IV. 15	
Griffithiana *Lea.* (June 18, 1841.)	IV. 20	
incisa *Lea.* (Dec. 16, 1842.)*	IV. 28	IV. 67.
Lewisii *Lea.* (Feb. 19, 1861.)	IX. 79	
picta *Con.*		IX. 77.
prærosa *Say.*		IV. 66 : IX. 77, 78.
rubiginosa *Lea.* (June 18, 1841.)	IV. 20	
Showalterii *Lea.* (Mar. 20, 1860.)	IX. 77	
solida *Lea.* (Dec. 16, 1842.)	IV. 29	
squalida *Lea.* (May 2, 1845.)	IV. 66	
subglobosa *Say.*		IV. 15.
tintinabulum *Lea.* (May 2, 1845.)	IV. 67	IX. 80.
Troostiana *Lea.* (Feb. 19, 1841.)	IV. 15	
tuberculata *Lea.* (June 18, 1841.)	IV. 21	
turbinata *Lea.* (Feb. 19, 1861.)	IX. 76	
variabilis *Lea.* (Feb. 19, 1841.)	IV. 15	
vittata *Lea.* (May 23, 1860.)	IX. 78	
ANCULOTUS.		
carinatus *Anth.*		III. 10.
costatus *Anth.*		III. 11.
Kirtlandianus *Anth.*		III. 10.
ASSIMINEA.		
carinata *Lea.* (June 3, 1856.)	IX. 76	

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* [Now Schiz. incisa *Lea.*]

BASISTOMA.	Description.	Miscellaneous References.
Edwardsii *Lea.* (Mar. 5, 1852.)	V. 52	
BYTHINIA.		
faculata *Beck.*		XI. 75.
globula *Lea.* (June 3, 1856.)	XI. 75	
Siamensis *Lea.* (June 3, 1856.)	XI. 75	
EURYCŒLON.		
Anthonyi (MEL.) *Redf.*		XI. 106.
basalis *Lea.*		XI. 106.
gibberosa *Lea.*		XI. 106.
midas *Lea.*		XI. 106.
tintinabulum (GON.) *Lea.*		XI. 106.
turbinata (GON.) *Lea.*		XI. 106.
umbonatum *Lea.* (June 12, 1864.)	XI. 106	
GONIOBASIS.		
Abbevillensis *Lea.* (May 27, 1862.)	IX. 145	
æqua *Lea.* (May 21, 1861.)	IX. 62	IX. 45.
Alabamensis *Lea.* (May 21, 1861.)	IX. 54	IX. 118: XI. 86.
Albanyensis *Lea.* (Jan. 12, 1864.)	XI. 97	XI. 96.
amœna *Lea.* (May 27, 1862.)	IX. 145	
Anthonyi *Lea.* (May 27, 1862.)	IX. 125	
aterina *Lea.* (May 19, 1863.)	XI. 92	
auricoma *Lea.* (May 27, 1862.)	IX. 130	
Bairdiana *Lea.* (May 27, 1862.)	IX. 139	
Barrattii *Lea.* (May 27, 1862.)	IX. 157	
bellula *Lea.* (May 21, 1861.)	IX. 59	IX. 43, 44, 166.
Bentonensis *Lea.* (May 27, 1862.)	IX. 158	
Binneyana *Lea.* (May 27, 1862.)	IX. 132	
blanda *Lea.* (May 21, 1861.) *	IX. 64	XI. 93.
Bridgesiana *Lea.* (May 27, 1862.)	IX. 127	
Brumbyi *Lea.* (May 27, 1862.)	IX. 118	
bullula *Lea.* (May 21, 1861.)	IX. 43	IX. 50.
cadus *Lea.* (May 27, 1862.)	IX. 167	
Cahawbensis *Lea.* (May 21, 1861.)	IX. 45	
calculoides *Lea.* (May 21, 1861.)	IX. 60	
Canbyi *Lea.* (May 27, 1862.)	IX. 162	IX. 163, 164.
capillaris *Lea.* (May 21, 1861.)	IX. 58	IX. 66.
cerea *Lea.* (May 27, 1862.)	IX. 143	IX. 144.
Christyi *Lea.* (May 27, 1862.)	IX. 150	XI. 93.

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* [Changed to versa.]

GONIOBASIS.	Description.	Miscellaneous References.
cinerea *Lea.* (May 27, 1862.)	IX. 128	
cinerella *Lea.* (May 27, 1862.)	IX. 150	
clausa *Lea.* (May 21, 1861.)	IX. 53	IX. 50, 54.
continens *Lea.* (May 27, 1862.)	IX. 143	
Coosaensis *Lea.* (May 21, 1861.)	IX. 56	IX. 57, 160, 165.
copiosa *Lea.* (May 21, 1861.)	IX. 61	
Couperii *Lea.* (May 27, 1862.)	IX. 163	IX. 164.
crenatella *Lea.* (Mar. 20, 1860.)	IX. 90	
crepera *Lea.* (May 21, 1861.)	IX. 62	
crispa *Lea.* (May 27, 1862.)	IX. 148	IX. 149.
cruda *Lea.* (May 27, 1862.)	IX. 154	
culta *Lea.* (May 21, 1861.)	IX. 59	IX. 61.
Cumberlandiensis *Lea.* (May 19, 1863.)	XI. 88	
Decampii *Lea.* (May 19, 1863.)	XI. 94	
difficilis *Lea.* (May 27, 1862.)	IX. 139	
Doolyensis *Lea.* (May 27, 1862.)	IX. 137	IX. 144.
Downieana *Lea.* (May 27, 1862.)	IX. 163	IX. 140, 164.
Draytonii *Lea.* (May 27, 1862.)	IX. 122	
Duttonii *Lea.* (May 27, 1862.)	IX. 136	
ellipsoides *Lea.* (May 21, 1861.) *	IX. 56	IX. 52, 57.
Elliottii *Lea.* (May 27, 1862.)	IX. 160	
elliptica *Lea.* (May 21, 1861.)	IX. 47	IX. 134.
Emeryensis *Lea.* (Jan. 12, 1864.)	XI. 93	
Estabrookii *Lea.* (May 27, 1862.)	IX. 120	
Etowahensis *Lea.* (May 27, 1862.)	IX. 121	
fabalis *Lea.* (May 27, 1862.)	IX. 133	
fallax *Lea.* (May 21, 1861.)	IX. 53	IX. 62.
fascinans *Lea.* (May 21, 1861.)	IX. 51	IX. 49.
flava *Lea.* (May 27, 1862.)	IX. 125	
flavescens *Lea.* (May 27, 1862.)	IX. 161	
fraterna *Lea.* (April 12, 1864.)	XI. 95	
fumea *Lea.* (May 21, 1861.)	IX. 44	
Gabbiana *Lea.* (May 27, 1862.)	IX. 126	
Georgiana *Lea.* (May 27, 1862.)	IX. 130	XI. 91.
Gerhardtii *Lea.* (May 27, 1862.)	IX. 152	IX. 153.
gibberosa *Lea.* (May 27, 1862.)	IX. 134	
glandaria *Lea.* (May 21, 1861.)	IX. 48	
gracilior *Lea.* (May 21, 1861.) †		IX. 52, 57.
granata *Lea.* (May 27, 1862.)	IX. 165	
gratiosa *Lea.* (May 21, 1861.)	IX. 63	
Grosvenorii *Lea.* (May 27, 1862.)	IX. 119	IX. 128.
Hallenbeckii *Lea.* (May 27, 1862.)	IX. 161	IX. 162.
Hartmanii *Lea.* (May 21, 1861.)	IX. 40	IX. 55.
inclinans *Lea.* (May 27, 1862.)	IX. 140	IX. 141.
inconstans *Lea.* (May 27, 1862.)	IX. 147	
induta *Lea.* (May 27, 1862.)	IX. 141	
infantula *Lea.* (May 19, 1863.)	XI. 91	
informis *Lea.* (May 19, 1863.)	XI. 92	
infuscata *Lea.* (May 27, 1862.)	IX. 152	
inosculata *Lea.* (May 27, 1862.)	IX. 156	IX. 144.
instabilis *Lea.* (May 27, 1862.)	IX. 151	XI. 93.
intercedens *Lea.* (May 27, 1862.)	IX. 127	

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* [Changed from gracilior—preoccupied.]

† [Changed to ellipsoides. IX. 57.]

GONIOBASIS.	Description.	Miscellaneous References.
interveniens *Lea.* (May 27, 1862.)	IX. 142	
Leidyana *Lea.* (May 27, 1862.)	IX. 144	
lepida *Lea.* (May 21, 1861.) *	IX. 49	
Lewisii *Lea.* (May 21, 1861.)	IX. 65	IX. 43.
Lindsleyi *Lea.* (May 27, 1862.)	IX. 141	IX. 142.
lita *Lea.* (May 21, 1861.)	IX. 61	
lithasoides *Lea.* (May 19, 1863.)	XI. 89	
Louisvillensis *Lea.* (May 19, 1863.)	XI. 89	
luteola *Lea.* (May 21, 1861.)	IX. 52	
Lyonii *Lea.* (May 27, 1862.)	IX. 135	IX. 136.
macella *Lea.* (May 27, 1862.)	IX. 155	
mediocris *Lea.* (May 27, 1862.)	IX. 148	
mellea *Lea.* (May 21, 1861.)	IX. 46	IX. 127.
midas *Lea.* (May 21, 1861.)	IX. 55	
Milesii *Lea.* (May 19, 1863.)	XI. 91	
mutabilis *Lea.* (May 27, 1862.)	IX. 153	
negata *Lea.* (May 27, 1862.)	IX. 159	
Newberryi *Lea.* (Mar. 20, 1860.)	IX. 122	IX. 140.
nigrina *Lea.* (April 1, 1856.)	IX. 124	IX. 122 : IX. 156.
nubila *Lea.* (May 21, 1861.)	IX. 57	IX. 48.
Ohioensis *Lea.* (May 27, 1862.)	IX. 128	IX. 129.
olivella *Lea.* (May 27, 1862.)	IX. 149	
orbicula *Lea.* (May 21, 1861.)	IX. 60	IX. 61.
ornatella *Lea.* (May 27, 1862.)	IX. 148	IX. 149.
osculata *Lea.* (May 27, 1862.)	IX. 118	
parva *Lea.* (May 27, 1862.)	IX. 119	
paula *Lea.* (May 21, 1861.)	IX. 66	
paupercula *Lea.* (May 27, 1862.)	IX. 146	IX. 147.
pergrata *Lea.* (May 21, 1861.)	IX. 65	
porrecta *Lea.* (May 19, 1863.)	XI. 95	
Postellii *Lea.* (July 6, 1858.)	IX. 165	
prairiensis *Lea.* (May 27, 1862.)	IX. 121	
Prestoniana *Lea.* (May 27, 1862.) †	IX. 129	XI. 93.
proletaria *Lea.* (May 27, 1862.)	IX. 147	
propinqua *Lea.* (May 21, 1861.)	IX. 56	
propria *Lea.* (May 21, 1861.)	IX. 51	
pudica *Lea.* (May 21, 1861.)	IX. 44	IX. 62.
pulla *Lea.* (April 12, 1864.)	XI. 86	
punicea *Lea.* (May 21, 1861.)	IX. 54	IX. 52.
pupæformis *Lea.* (April 12, 1864.)	XI. 86	
purpurea *Lea.* (May 21, 1861.)	IX. 47	
purpurella *Lea.* (May 27, 1862.)	IX. 149	
Pybasii *Lea.* (May 27, 1862.)	IX. 135	
quadricincta *Lea.* (April 12, 1864.)	XI. 87	
quadrivittata *Lea.* (May 21, 1861.)	IX. 48	
rara *Lea.* (May 21, 1861.)	IX. 42	
Romæ *Lea.* (April 12, 1864.)	XI. 85	
rubella *Lea.* (May 27, 1862.)	IX. 154	IX. 155 : XI. 94.
rubicunda *Lea.* (May 21, 1861.)	IX. 57	
rubiginosa *Lea.* (May 27, 1862.)	IX. 155	
rubricata *Lea.* (May 27, 1862.)	IX. 157	

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* [Changed from propria—preoccupied.]

† [Changed from Vanuxemii—preoccupied.]

GONIOBASIS.	Description.	Miscellaneous References.
Shastaensis *Lea.* (April 1, 1856.)	IX. 159	
Shelbyensis *Lea.* (May 21, 1861.)	IX. 50	
Showalterii *Lea.* (May 21, 1861.)	IX. 42	IX. 59.
Smithsoniana *Lea.* (April 12, 1864.)	XI. 93	
solidula *Lea.* (May 21, 1861.)	IX. 52	
sparsus *Lea.* (May 27, 1862.)	IX. 138	
Spartanburgensis *Lea.* (May 27, 1862.)	IX. 129	XI. 89.
Spillmanii *Lea.* (May 27, 1862.)	IX. 124	
spinella *Lea.* (May 27, 1862.)	IX. 120	
Stewardsoniana *Lea.* (May 27, 1862.)	IX. 166	
straminea *Lea.* (May 21, 1861.)	IX. 49	IX. 50.
strenua *Lea.* (May 27, 1862.)	IX. 138	
suavis *Lea.* (May 21, 1861.)	IX. 50	IX. 43, 152.
subrhombica *Lea.* (April 12, 1864.)	XI. 88	
tenebrovittata *Lea.* (May 27, 1862.)	IX. 123	
Thorntonii *Lea.* (May 27, 1862.)	IX. 142	
Tryoniana *Lea.* (May 27, 1862.)	IX. 164	IX. 161.
Tuomeyi *Lea.* (May 27, 1862.)	IX. 133	
Ucheensis *Lea.* (May 27, 1862.)	IX. 156	IX. 157.
Vanuxemii *Lea.* (May 27, 1862.) *	IX. 129	XI. 93.
varians *Lea.* (May 21, 1861.)	IX. 41	IX. 42 : XI. 42.
variata *Lea.* (May 21, 1861.)	IX. 46	
Vauxiana *Lea.* (May 27, 1862.)	IX. 131	IX. 132 : XI. 109.
versa *Lea.* (May 21, 1861.) †	IX. 64	XI. 93.
vesicula *Lea.* (May 21, 1861.)	IX. 64	
Viennaensis *Lea.* (May 27, 1862.)	IX. 137	
virgulata *Lea.* (May 21, 1861.)	IX. 45	
viridicata *Lea.* (May 27, 1862.)	IX. 144	
viridistriata *Lea.* (Jan. 12, 1864.)	XI. 96	XI. 97.
vitatella *Lea.* (May 19, 1863.)	XI. 90	
Whitei *Lea.* (May 27, 1862.)	IX. 132	
IO.		
fluvialis (**FUSUS**) *Say.*	....	I. 132, 224 : IV. 17 : IX. 167.
fusiformis *Lea.* (Jan. 7, 1831.)	I. 132	IX. 167.
gracilis *Lea.* (Dec. 24, 1861.)	IX. 171	
modesta *Lea.* (Dec. 24, 1861.)	IX. 170	
nodosa *Lea.* (Dec. 24, 1861.)	IX. 168	IX. 169.
nobilis (**MEL.**) *Lea.* ‡	....	IX. 168.
robusta *Lea.* (Dec. 24, 1861.)	IX. 168	
Spillmanii *Lea.* (Dec. 24, 1861.)	IX. 170	IX. 171.
spinosa *Lea.* (Feb. 7, 1834.)	I. 224	IX. 167.
tenebrosa *Lea.* (June 18, 1841.)	IV. 17	
variabilis *Lea.* (Dec. 24, 1861.)	IX. 169	
viridula *Lea.* (Dec. 24, 1861.)	IX. 171	

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* [Changed to Prestoniana. XI. 93.]

† [Changed from blanda—preoccupied. XI. 93.]

‡ [See Mel nobilis.]

LITHASIA.	Description.	Miscellaneous References.
armigera *Say.*		XI. 102.
brevis (MEL.) *Lea.* (Dec. 16, 1842.)	IV. 26	IX. 176.
dilatata *Lea.* (Feb. 19, 1861.)	IX. 82	
Downiei *Lea.* (June 3, 1862.)	IX. 176	XI. 90.
Florentiana (MEL.) *Lea.* *		IX. 46.
fuliginosa (MEL.) *Lea.*		IX. 46.
fusiformis *Lea.* (Feb. 19, 1861.)	IX. 83	
imperialis *Lea.* (Feb. 19, 1861.)	IX. 80	IX. 81.
nuclea *Lea.* (May 23, 1860.)	IX. 85	
Showalterii *Lea.* (May 23, 1860.)	IX. 84	IX. 48, 133.
subglobosa *Lea.* (Feb. 19, 1861.)	IX. 83	
Tuomeyi *Lea.* (Feb. 19, 1861.)	IX. 81	
vittata *Lea.* (June 3, 1862.)	IX. 176	

MELANIA.

[Species originally described as Melania and species referred to by that designation. Species that since their description have been referred to other subgenera, will have the subgeneric abbreviations following them.]

abrupta (GON.) *Lea.* (May 2, 1845.)	IV. 59	IX. 53, 145.
aculeus *Lea.* (Mar. 15, 1833.)	I. 193	
acuta (GON.) *Lea.* (May 7, 1830.)	I. 111	IX. 143.
acuto-carinata *Lea.* (Sept. 18, 1835.)	III. 22	
adusta (GON.) *Lea.*		XI. 93.
affinis *Lea.* (July 8, 1856.)	XI. 81	XI. 77.
Alexandrensis *Lea.* (May 2, 1845.)	IV. 61	V. 55.
althea (GON.) *Anth.*		IX. 138.
altilis *Lea.* (Jan. 15, 1841.)	III. 12	
alveare *Con.*		IV. 27, 57, 61.
amarula *Lam.*		II. 20.
annulifera *Con.*		IV. 26: V. 54: IX. 114.
arata *Lea.* †		IV. 24.
arctata *Lea.* (May 2, 1845.)	IV. 64	
armigera (LITH.) *Say.*		I. 111: IV. 20: XI. 102.
atra *Richard.* [1845.)		XI. 85.
auriculæformis (GON.) *Lea.* (May 2,	IV. 62	V. 56: IX. 64, 134.
australis *Lea.* (July 8, 1856.) ‡		XI. 82.
Babylonica *Lea.* (Jan. 15, 1841.)	III. 21	
basalis (GON.) *Lea.* (May 2, 1845.)	IV. 59	IX. 55, 85, 135, 151.
bicincta *Anth.*		IX. 66.
bicostata (TRI.) *Lea.*		IX. 112.
blanda *Lea.* (Jan. 15, 1841.)	III. 17	III. 4.
Bonninensis *Lea.* (July 8, 1856.)	XI. 77	
Boykiniana (GON.) *Lea.* (Oct. 2, 1840.)	III. 66	IX. 158, 162: XI. 96, 97.
Braziliensis *Lea.*		V. 51.

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* [See Mel. Florentiana *Lea.*]

† [Changed from exarata—preoccupied.]

‡ [Changed to Manillaensis]

MELANIA.	Description.	Miscellaneous References.
breviformis *Parey.*		IV. 30.
brevis (GON.) *Lea.* (Dec. 16, 1842.)	IV. 26	IX. 161.
Brumbyi (TRI.) *Lea.* (Mar. 5, 1852.)	V. 54	IX. 109.
Buddii (GON.) *Lea.* (May 2, 1845.)	IV. 64	IX. 166.
bullata *Lea.* (July 8, 1856.)	XI. 85	
caliginosa (GON.) *Lea.* (Jan. 15, 1841.)	III. 27	IX. 165.
canaliculata (TRI.) *Say.*		IV. 58 : IX. 91, 100, 101, 106, 107, 113, 114, 116 : XI. 101.
carino-costata *Lea.* (May 2, 1845.)	IV. 62	
carneola (GON.) *Anth.*		IX. 130.
castanea (GON.) *Lea.* (Jan. 15, 1841.)	III. 2	IX. 145.
catenaria *Say.*		III. 28.
catenoides *Lea.* (Oct. 2, 1840.)	III. 66	
Cincinnatiensis *Lea.* (Dec. 1, 1838.)	III. 28	
circincta *Lea.* (Jan. 15, 1841.)	III. 25	
clavæformis *Lea.* (Jan. 15, 1841.)	III. 6	III. 2.
clavata ——— ?		III. 6.
Clarkii *Lea.* (Mar. 5, 1852.)	V. 53	
cognata (GON.) *Anth.*		XI. 91.
columella (GON.) *Lea.* (Jan. 15, 1841.)	III. 17	IX. 139.
concinna (GON.) *Lea.* (Jan. 15, 1841.)	III. 21	XI. 94.
conica (TRI.) *Say.*		IV. 28 : IX. 46, 100 : XI. 100.
consanguinea *Anth.*		IX. 85.
corneola (GON.) *Anth.*		IX. 65.
corrugata *Lea.* (Jan. 15, 1841.) *	III. 15	
costulata (GON.) *Lea.* (Jan. 15, 1841.)	III. 19	IX. 137, 142, 143.
crebricostata *Lea.* (Jan. 15, 1841.)	III. 17	
crebristriata (GON.) *Lea.* (May 2, '45.)	IV. 65	IX. 58, 66.
curvata *Lea.* (Dec. 16, 1842.)	IV. 28	
Curreyana *Lea.* (Jan. 15, 1841.)	III. 18	
decora *Lea.* (Jan. 15, 1841.)	III. 19	IX. 137.
depygis *Say.* [1842.)†		III. 11 : XI. 89, 90.
Deshayesiana (GON.) *Lea.* (Dec. 16,		IV. 24 : IX. 135, 136, 137, 138, 139, 140, 141, 145, 146, 147, 167.
dilatata *Con.*		III. 9, 10.
dubiosa (GON.) *Lea.* (Jan. 15, 1841.)	III. 4	IX. 99, 121.
Duttoniana (LITH.) *Lea.* (Jan. 15, '41.)	III. 26	III. 9 : IX. 81, 136.
ebenum (GON.) *Lea.* (Jan. 15, 1841.)	III. 4	IV. 19 : IX. 47.
Edgariana *Lea.* (Jan. 15, 1841.)	III. 18	IX. 140, 143.
elata (GON.) *Gould.*		XI. 87.
elevata *Say.*		IV. 63.
elongata (TRI.) *Lea.* (May 20, 1831.)	I. 130	IX. 109 : XI. 104.
exarata *Lea.* (Jan. 15, 1841.) ‡	III. 21	IV. 24.
excurata *Con.*		IV. 66.
excisa (SCHIZ.) *Lea.* (Dec. 16, 1842.)	IV. 25	IV. 67.
expansa *Lea.* (Dec. 16, 1842.)	IV. 28	
fasciolata *Lam.*		XI. 81.
figurata *Hinds.*		XI. 81.
filum (TRI.) *Lea.* (May 2, 1845.)	IV. 62	IX. 106.
flaniger *Dunker.*		XI. 81.
Florentiana (LITH.) *Lea.* (Jan. 15, '41.)	III. 26	IX. 46, 82.
Foremanii *Lea.* (Dec. 16, 1842.)	IV. 27	
fraterna *Lea.* (July 8, 1856.)	XI. 84	
fuliginosa (LITH.) *Lea.* (Jan. 15, 1841.)	III. 8	IX. 46.
furva *Lea.* (Mar. 5, 1852.)	V. 55	
fusiformis (GON.) *Lea.* (Jan. 15, 1841.)	III. 5	III. 2 : V. 58 : IX. 130, 133.

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* [Changed to rugosa. Vol. III. *ante*, p. 1, and Proc. A. N. S. II. 237.] † [Changed from plicatula—preoccupied.] ‡ [Changed to arata.]

MELANIA.	Description.	Miscellaneous References.
germana (**GON.**) *Anth.*		IX. 45: XI. 109.
gibbosa *Lea.* (Mar. 5, 1852.)	V. 57	
glaber (**GON.**) *Lea.* (June 18, 1841.)	IV. 18	XI. 90.
globula *Lea.* (Jan. 15, 1841.)	III. 12	
gracilis (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 6	IX. 125, 133.
gracilis *Anth.*		IX. 102.
gracilior (**GON.**) *Anth.*		IX. 122.
grata *Anth.*		IX. 121, 123, 125, 136, 152: XI. 87.
gravida *Anth.*		IX. 127.
Hainesiana *Lea.* (July 8, 1856.)	XI. 78	
Haleiana *Lea.* (May 2, 1845.)	IV. 60	IV. 61.
harpa *Lea.* (May 2, 1845.)	IV. 64	
Haysiana (**GON.**) *Lea.* (Dec. 16, 1842.)	IV. 25	IV. 64: IX. 41, 57, 63.
herculea *Gould.*		XI. 83.
Hildrethiana *Lea.* (Jan. 15, 1841.)	III. 2	
Holstonia (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 27	IX. 161.
Housei *Lea.* (July 8, 1856.)	XI. 81	
Hydei (**GON.**) *Con.*		IX. 167.
iostoma *Anth.*		IX. 47.
impressa (**GON.**) *Lea.* (June 18, 1841.)	IV. 19	IV. 65: IX. 58, 66.
inflata (**ANC.**) *Lea.* (Dec. 19, 1834.)	II. 17	III. 9, 10: V. 57.
infrafasciata (**TRI.**) *Anth.*		IX. 113, 114.
inhonesta *Phili.*		XI. 81.
isogona *Say.* *		IV. 16.
Jayana (**LITH.**) *Lea.* (June 18, 1841.)	IV. 20	XI. 102.
Kirtlandiana (**GON.**) *Lea.* (Jan. 15, '41.)	III. 3	IX. 118.
lævigata *Lea.* †	III. 3	IX. 119.
lævis *Lea.* (Jan. 15, 1841.)		
laqueata *Say.*		III. 19: IX. 136.
Largillierti *Phili.*		XI. 83, 84.
Lecontiana (**GON.**) *Lea.* (Jan. 15, '41.)	III. 15	IX. 153: XI. 94.
ligata *Menke.*		IX. 111.
lugubris *Lea.* (May 2, 1845.)	IV. 58	
lyræformis *Lea.* (July 8, 1856.)	XI. 82	
Manillaensis *Lea.* (July 8, 1856.) ‡	XI. 82	
Mauiensis *Lea.* (July 8, 1856.)	XI. 79	
Menkiana *Lea.* §		IV. 24.
microstoma *Lea.*		V. 51.
Mindoriensis *Lea.* (1850.)		XI. 79.
modesta (**GON.**) *Lea.* (May 2, 1845.)	IV. 60	IX. 99.
monozonalis *Lea.* (Jan 15, 1841.)	III. 16	
multilineata *Say.*		II. 92.
multistriata *Say.*		IV. 64.
Myersiana *Lea.* (July 8, 1856.)	XI. 80	XI. 82, 83.
nassula *Con.*		III. 28.
neglecta *Anth.*		IX. 95.
Newcombii *Lea.* (July 8, 1856.)	XI. 78	XI. 79.
Niagarensis (**GON.**) *Lea.* (Jan. 15, '41.)	III. 11	IX. 98, 129: XI. 91.
Nickliniana (**GON.**) *Lea.* (Jan. 15, '41.)	III. 9	IV. 59: IX. 131, 132: XI. 93.
Ningpooensis *Lea.* (July 8, 1856.)	XI. 80	

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* [Changed to Amnicola isogona.]

† [Changed to lævis.]

‡ [Changed from australis—preoccupied.]

§ [Changed from plicatula—preoccupied.]

MELANIA.	Description.	Miscellaneous References.
nitens (GON.) *Lea.* (Jan. 15, 1841.)	III. 20	IX. 126.
nobilis (IO) *Lea.* (May 2, 1845.)	IV. 65	IX. 168.
nodulosa *Lea.* (Dec. 1, 1838.)	III. 28	
oblita *Lea.* (Mar. 5, 1852.)	V. 54	
obovata *Say.*		IX. 79, 85.
obtusa (GON.) *Lea.* (Jan. 15, 1841.)	III. 14	XI. 94.
occata *Hinds.*		XI. 111.
occidentalis *Lea.* (Jan. 15, 1841.)	III. 10	III. 11.
Ocoeensis (GON.) *Lea.* (Jan. 15, 1841.)	III. 7	III. 8: IX. 99, 112.
oliva *Lea.* (May 2, 1845.)	IV. 27	
olivula *Con.*		V. 56: IX. 49.
oppugnata (GON.) *Lea.* (Mar. 5, 1852.)	V. 56	IX. 55.
Ordiana (TRI.) *Lea.* (Dec. 16, 1842.)	IV. 26	IX. 115.
ovalis (GON.) *Lea.* (Dec. 16, 1842.)	IV. 25	IX. 48, 51, 56, 61.
ovoidea (GON.) *Lea.* (May 2, 1845.)	IV. 61	IX. 130: XI. 89.
pallescens (GON.) *Lea.* (May 2, 1845.)	IV. 63	XI. 86.
percarinata *Con.*		V. 55.
pernodosa (LITH.) *Lea.* (May 2, 1845.)	IV. 66	XI. 102.
perstriata *Lea.* (Mar. 5, 1852.)	V. 52	
perfusca (GON.) *Lea.* (June 18, 1841.)	IV. 18	IX. 126, 154.
picta *Lea.* (June 18, 1841.)	IV. 19	IV. 25.
pilula *Lea.* (Jan. 15, 1841.)	III. 24	
pinguis *Lea.* (Mar. 5, 1852.)	V. 57	IX. 103.
Planensis *Lea.* (May 18, 1858.)	XI. 83	
plicata *Lea.* (Jan. 2, 1835.) *	II. 20	IV. 24.
plicatula *Lea.* (Jan. 2, 1835.) †	III. 20	IV. 24.
plicifera *Lea.* (Nov. 4, 1836.)	II. 93	
porcatus *Jonas.*		XI. 79.
Potosiensis *Lea.* (Jan. 15, 1841.)	III. 22	
prasinata *Con.*		IX. 93.
Prestoniana *Lea.* ‡		XI. 93.
producta *Lea.* (Dec. 16, 1842.)	IV. 28	
proteus *Lea.* (May 2, 1845.)	IV. 57	IX. 50.
proxima (GON.) *Say.*		IX. 156, 158, 175.
pumila (STREPH.) *Lea.* (May 2, 1845.)	IV. 60	IX. 88, 101.
pupæformis *Anth.*		IX. 54.
pupoidea (GON.) *Anth.*		IX. 49, 51, 56: XI. 86.
pyramidata *Hinds.*		XI. 81.
pyrenella *Con.*		IX. 92.
regularis (TRI.) *Lea.* (Jan. 15, 1841.)	III. 8	IV. 59: IX. 94.
rhomboidea (GON.) *Anth.*		IX. 66: XI. 86, 88.
robusta (GON.) *Lea.* (June 18, 1841.)	IV. 19	IX. 41, 61.
Rogersii *Con.*		III. 9, 10.
rubida *Lea.* (July 8, 1856.)	XI. 77	
rudis *Lea.*		V. 51.
rufa *Lea.* (Jan. 15, 1841.) §	III. 5	IV. 18.
rufescens (GON.) *Lea.*		XI. 87.
rugosa (GON.) *Lea.* (Jan. 15, 1841.) ‖	III. 15	IX. 150.
Saffordii *Lea.* (Mar. 5, 1852.)	V. 56	
salebrosa (LITH.) *Con.*		IX. 82, 83.
Sayii *Ward.*		IX. 98.
scilicula *Gould.*		XI. 82.
sculptilis *Lea.* (Mar. 5, 1852.)	V. 53	XI. 104.

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* [Changed to Menkiana.] † [Changed to Deshayesiana.] ‡ [Changed from Vanuxemii—preoccupied]

§ [Preoccupied—changed to rufescens. Vol. III. *ante*, p. 1.] ‖ [Changed from corrugata—preoccupied. Vol. III. *ante*, p. 1]

MELANIA.	Description.	Miscellaneous References.
semicarinata *Say.*		IX. 124.
seminalis [**PAL.**] *Hinds.*		XI. 111.
Sellersiana *Lea.* (Mar. 5, 1852.)	V. 55	IX. 150.
semigranulata (**GON.**) *Desh.*		IX. 82.
simplex *Say.*		III. 4, 7: IX. 100.
solida *Lea.* (May 2, 1845.) *	IV. 57	
solida (**STREPH.**) *Lea.* *	IX. 88	
sordida *Lea.* (Jan. 15, 1841.)	III. 8	V. 57.
spinulosa *Lam.*		IX. 162.
spinalis *Lea.* (May 2, 1845.)	IV. 63	
spurca *Lea.* (May 2, 1845.)	IV. 59	
striata *Lea.* (Jan. 15, 1841.) †	III. 24	
striatula (**GON.**) *Lea.*		V. 53: IX. 90.
strigosa (**TRI.**) *Lea.* (Jan. 15, 1841.)	III. 13	IX. 96, 116.
subcylindracea *Lea.* (Jan. 15, 1841.)	III. 7	
subglobosa *Say.*		III. 10.
subimbricata *Phili.*		XI. 85.
subsolida *Lea.* (Jan 15, 1841.)	III. 6	
subularis (**TRI.**) *Lea.* (May 7, 1830.)	I. 110	I. 131: IX. 98.
sulcosa *Lea.* (Jan 15, 1841.)	III. 23	
Taitiana (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 3	IX. 123.
Tamsii *Dunker.*		XI. 81.
tuberosa (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 14	III. 4: IV. 60: IX. 157: XI. 89.
terebralis (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 16	IX. 120.
teres (**GON.**) *Lea.* (Jan. 15, 1841.)	III. 14	III. 5, 13: IX. 154.
tornatella *Lea.*		V. 51.
torta *Lea.* (May 2, 1845.)	IV. 58	
torquata *Lea.* (Dec. 16, 1842.)	IV. 27	
transversa *Lea.*		V. 51: XI. 84, 85.
Troostiana *Lea.* (Nov. 4, 1836.)	II. 92	
tuberculata *Lea.* (May 7, 1830.)	I. 111	II. 18.
turgida (**TRI.**) *Lea.* (June 18, 1841.)	IV. 18	IX. 104.
uncialis *Hald.*		IX. 174.
undosa *Anth.*		IX. 85.
undulata (**TRI.**) *Say.*		IX. 106, 117: XI. 102.
Vanuxemiana (**GON.**) *Lea.*	IV. 25	IV. 26: IX. 56, 60, 172.
variabilis *Lea.*		IV. 28.
varicosa *Troschel.*		XI. 84.
varicosa *Ward.*		IX. 119, 128.
Verreauxiana *Lea.* (July 8, 1856.)	XI. 83	
venusta *Lea.* (Jan 15, 1841.)	III. 25	IX. 82.
virgata *Lea.* (Jan 15, 1841.)	III. 13	
viridis *Lea.* (Jan. 15, 1841.)	III. 10	
Virginica (**GON.**) *Say.*		I. 111: II. 93: III. 14: IV. 60, 64: IX. 159.
Warderiana (**GON.**) *Lea.* (Jan. 15, '41.)	III. 23	IV. 58: XI. 94.
MELANOPSIS.		
Braziliensis *Mor.*		IV. 24.
crino-carina *Mor.*		IV. 24.

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* [Re-described. IX. 88.]

† [Changed to striatula. Vol. III. *ante*, p. 1.]

MELANOPSIS.	Description.	Miscellaneous References.
maculata *Lea.* (Mar. 15, 1833.)	I. 194	
princeps *Lea.* (Mar 15, 1833.)	I. 194	
MESESCHIZA.		
Grosvenorii *Lea.* (Jan. 12, 1864.)	XI. 108	
NERITINA.		
Showalterii *Lea.* (Feb. 12, 1861.)	IX. 89	
PACHYCHILUS.		
parvum *Lea.* (July 8, 1856.)	XI. 76	
PALUDINA.		
Alleghaniensis *Green.*	....	IV. 13.
altilis *Ravenal.*	....	III. 12.
angulata *Lea.* (June 18, 1841.)	IV. 22	
bimonilifera *Lea.* (Mar. 16, 1832.)	I. 170	
Burroughiana *Lea.* (Feb. 7, 1834.)	I. 225	
Chinensis *Lea.**	....	XI. 72.
Cincinnatiensis *Anth.*	....	IV. 16.
coarctata *Lea.* (Dec. 16, 1842.)	IV. 30	
Coosaensis *Lea.* (June 18, 1841.)	IV. 23	
crassa *Benson.*	....	XI. 72.
cyclostomatiformis *Lea.* (June 18, '41.)	IV. 23	
decisa *Say.*	....	I. 228 : II. 91.
Elliottii *Lea.* (July 6, 1858.)	XI. 140	
Georgiana *Lea.* (April 18, 1834.)	I. 228	
Hainesiana *Lea.* (June 3, 1856.)	XI. 72	XI. 73.
Haleiana *Lea.* (May 2, 1845.)	IV. 70	
hyalina *Lea.* (Dec. 19, 1834.)	II. 17	
incrassata *Lea.* (Dec. 16, 1842.)	IV. 30	
Ingallsiana *Lea.* (June 3, 1856.)	XI. 74	
integra *Say.*	....	XI. 40.
limosa *Say.*	....	III. 67 : IV. 16.
lustrica *Say.*	....	IV. 16.
Mahewana *Grat.*	....	IV. 14.
Milesii *Lea.* (May 19, 1863.)	XI. 140	

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* [Changed to orientalis.]

PALUDINA.	Description.	Miscellaneous References.
Nickliniana *Lea.* (Nov. 4, 1836.)	II. 92	
nuclea *Lea.* (Nov. 4, 1836.)	II. 91	
Nuttalliana *Lea.* (July 21, 1837.)	II. 101	
obtusa *Lea.* (Feb. 19, 1841.)	IV. 13	
obtusa *Troschel.*		XI. 72, 73.
orientalis *Lea.* (June 3, 1856.) *	XI. 71	
pallida *Lea.* (Sept. 18, 1835.)	II. 22	IV. 16.
porata *Say.*		IV. 16.
pyramidata *Phili.*		XI. 72.
regularis *Lea.* (Feb. 19, 1841.)	IV. 13	
sinistrosa *Lea.* (Nov. 4, 1836.)	II. 90	
subcarinata *Say.*		XI. 141.
subpurpurea *Say.*		XI. 140.
Swainsonii *Lea.* (June 3, 1856.)	XI. 73	
Troostiana *Lea.* (Feb. 19, 1841.)	IV. 14	IV. 70.
umbilicata *Lea.* (June 3, 1856.)	XI. 73	XI. 74.
unicolor *Lam.*		IV. 14: XI. 73.
virens *Lea.* (Nov. 4, 1836.)	II. 91	
viridis *Lam.*		IV. 13.
PALUDOMUS.		
loricata *Reeve.*		IX. 78.
maculata *Lea.* (June 3, 1856.) †		XI. 74.
RIVINULA.		
maculata *Lea.* (June 3, 1856.) ‡	XI. 74	
spirialis *Reeve.*		XI. 75.
Zeylanica (**MEL.**) *Lea.* (1850.)		XI. 75.
SCHIZOSTOMA.		
Alabamensis *Lea.* (May 22, 1860.)	IX. 72	
Babylonicum Lea. (May 2, 1845.)	IV. 68	IX. 70.
bulbosa *Anth.*		IX. 75.
Buddii *Lea.* (May 2, 1845.)	IV. 68	IX. 74.
carinifera *Anth.*		XI. 106.
castaneum *Lea.* (May 22, 1860.)	IX. 69	
constrictum *Lea.* (May 2, 1845.)	IV. 68	XI. 105.

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* [Changed from Chinensis—preoccupied.]

† [Changed to Rivinula *Lea.* XI. 74.]

‡ [Changed from Paludomus.]

SCHIZOSTOMA.	Description.	Miscellaneous References.
excisa *Lea.*		IX. 72.
funiculatum *Lea.* (May 2, 1845.)	IV. 69	
glandula *Lea.* (May 22, 1860.)	IX. 71	IX. 71, 74.
glans *Lea.* (May 22, 1860.)	IX. 70	IX. 71, 74.
globosum *Lea.* (May 22, 1860.)	IX. 74	IX. 60.
Hartmanii *Lea.* (May 22, 1860.)	IX. 69	
laciniatum *Lea.* (May 2, 1845.)	IV. 69	IX. 75.
pagoda *Lea.* (May 2, 1845.)	IV. 67	IX. 66.
pumilum *Lea.* (May 22, 1860.)	IX. 74	
recta *Anth.*		IX. 70.
Showalterii *Lea.* (Mar. 20, 1860.)	IX. 68	
Showalterii *Lea.* (April 12, 1864.)	XI. 105	
Spillmanii *Lea.* (Feb. 19, 1861.)	IX. 72	
virens *Lea.* (May 22, 1860.)	IX. 75	
Wetumpkaense *Lea.* (May 22, 1860.)	IX. 73	IX. 73, 74.
STREPHOBASIS.		
carinata *Lea.* (June 3, 1862.)	IX. 177	
Clarkii *Lea.* (April 16, 1861.)	IX. 87	IX. 177.
cornea *Lea.* (April 16, 1861.)	IX. 87	
Lyonii *Lea.* (Jan. 12, 1864.)	XI. 107	
olivaria *Lea.* (June 3, 1862.)	IX. 178	IX. 112 : XI. 107.
solida *Lea.* (Redescribed.)*	IX. 88	IX. 178.
Spillmanii *Lea.* (April 16, 1861.)	IX. 86	XI. 107.
TRYPANOSTOMA.		
affine *Lea.* (Jan. 12, 1864.)	XI. 101	
Alabamense *Lea.* (April 15, 1862.)	IX. 110	XI. 103.
Anthonyi *Lea.* (April 15, 1862.)	IX. 115	XI. 102.
attenuatum *Lea.* (April 15, 1862.)	IX. 96	
bivittatum *Lea.* (April 15, 1862.)	IX. 101	IX. 100, 101, 102.
canalitium *Lea.* (April 15, 1862.)	IX. 114	
carinatum *Lea.* (Jan. 12, 1864.)	XI. 104	
Carolinense *Lea.* (June 3, 1862.)	IX. 173	
Chakasahaense *Lea.* (April 15, 1862.)	IX. 102	IX. 174.
Christyi *Lea.* (April 15, 1862.)	IX. 94	IX. 96 : XI. 100.
cinctum *Lea.* (April 12, 1864.)	XI. 103	
Clarkii *Lea.* (April 15, 1862.)	IX. 107	
corneum *Lea.* (April 12, 1864.)	XI. 104	

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* [Mel. solida. May 2, 1845.]

TRYPANOSTOMA.	Description.	Miscellaneous References.
curtatum *Lea.* (May 19, 1863.)	XI. 99	
Currierianum *Lea.* (May 19, 1863.)	XI. 103	
cylindraceum *Lea.* (Jan. 12, 1864.)	XI. 98	XI. 99.
dignum *Lea.* (June 3, 1862.)	IX. 172	
dux *Lea.* (April 15, 1862.)	IX. 105	
Estabrookii *Lea.* (April 15, 1862.)	IX. 95	IX. 94, 96.
Florencense *Lea.* (April 15, 1862.)	IX. 109	IX. 110.
Hartmanii *Lea.* (April 15, 1862.)	IX. 92	IX. 98: XI. 98, 102.
Henryanum *Lea.* (June 3, 1862.)	IX. 173	
incurvum *Lea.* (April 15, 1862.)	IX. 108	
Jayi *Lea.* (April 15, 1862.)	IX. 92	
Knoxense *Lea.* (April 15, 1862.)	IX. 103	
Knoxvillense *Lea.* (April 15, 1862.)	IX. 96	
labiatum *Lea.* (April 15, 1862.)	IX. 94	IX. 105.
lativittatum *Lea.* (June 3, 1862.)	IX. 174	IX. 175.
Lesleyii *Lea.* (Jan. 12, 1864.)	XI. 102	
Lewisii *Lea.* (April 15, 1862.)	IX. 114	
ligatum *Lea.* (April 15, 1862.)	IX. 110	
luteum *Lea.* (June 3, 1862.)	IX. 172	
Lyonii *Lea.* (May 19, 1863.)	XI. 100	
minor *Lea.* (April 15, 1862.)	IX. 100	XI. 99.
modestum *Lea.* (April 15, 1862.)	IX. 98	XI. 100.
moniliferum *Lea.* (April 15, 1862.)	IX. 117	XI. 101.
moriforme *Lea.* (April 15, 1862.)	IX. 112	IX. 111: XI. 98.
mucronatum *Lea.* (May 21, 1861.)	IX. 99	XI. 108.
napoideum *Lea.* (April 12, 1864.)	XI. 99	
olivaceum *Lea.* (April 15, 1862.)	IX. 112	
pallidum *Lea.* (April 15, 1862.)	IX. 97	
parvum *Lea.* (April 15, 1862.)	IX. 98	IX. 102: XI. 98.
Postellii *Lea.* (April 15, 1862.)	IX. 108	
pumilum *Lea.* (April 15, 1862.)	IX. 101	XI. 99.
Pybasii *Lea.* (April 15, 1862.)	IX. 111	
Roanense *Lea.* (Jan. 12, 1864.)	XI. 98	
rostellatum *Lea.* (June 3, 1862.)	IX. 175	
Showalterii *Lea.* (April 15, 1862.)	IX. 115	
simplex *Lea.* (April 15, 1862.)	IX. 99	IX. 173.
Spillmanii *Lea.* (April 15, 1862.)	IX. 93	IX. 107.
striatum *Lea.* (April 15, 1862.)	IX. 116	
strictum *Lea.* (June 3, 1862.)	IX. 174	
subrobustum *Lea.* (Jan. 12, 1864.)	XI. 97	
subulæforme *Lea.* (April 15, 1862.)	IX. 111	
Sycamorensis *Lea.* (April 15, 1862.)	IX. 105	
Tennesseense *Lea.* (April 15, 1862.)	IX. 103	
Thorntonii *Lea.* (April 15, 1862.)	IX. 106	IX. 108: XI. 101.
tortum *Lea.* (April 15, 1862.)	IX. 97	

TRYPANOSTOMA.	Description.	Miscellaneous References.
trivittatum *Lea.* (April 15, 1862.).....	IX. 104	
trochulus *Lea.* (April 15, 1862.).......	IX. 104	
Troostii *Lea.* (April 15, 1862.)........	IX. 107	
Tuomeyi *Lea.* (April 15, 1862.).......	IX. 109	
univittatum *Lea.* (April 12, 1864.)....	XI. 101	
Vanuxemii *Lea.* (April 15, 1862.).....	IX. 102	IX. 104, 173.
venustum *Lea.* (April 12, 1864.)......	XI. 107	XI. 105.
viride *Lea.* (April 15, 1862.)..........	IX. 113	
Whitei *Lea.* (April 15, 1862.).........	IX. 95	IX. 175.
VALVATA.		
arenifera *Lea.*.......................*	I. 114	I. 139.
bicarinata *Lea.* (June 18, 1841.)......	IV. 21	
tricarinata *Say.*......................	....	IV. 21.

* [Larva case of Phrygania. I. 139.]

SECTION VI.

LIMNÆIDÆ.

SUBSECTIONS { ANCYLUS, LYMNÆA, MEGASYSTROPHA,

SUBSECTIONS { PHYSA, PLANORBIS, POMPHOLIX.

ANCYLUS.	Description.	MISCELLANEOUS REFERENCES.
crassus *Hald.*		XI. 142.
Newberryi *Lea.* (July 6, 1858.)	XI. 141	
Nuttallii *Hald.*		XI. 142.
patelloides *Lea.* (April 1, 1856.)	XI. 141	
præclarus *Stimpson.*		XI. 142.
LYMNÆA.		
acuta *Lea.* (April 18, 1834.)	I. 226	IV. 12.
apicina *Lea.* (July 21, 1837.)	II. 102	
appressa *Say.*		IV. 8.
arctica *Lea.* (April 19, 1864.)	XI. 116	
bulimoides *Lea.* (Feb. 19, 1841)	IV. 9	IV. 12: XI. 118, 119.
caperata *Say.*		XI. 116.
casta *Lea.* (Feb. 19, 1841.)	IV. 11	IV. 10.
coarctata *Lea.* (Feb. 19, 1841.)	IV. 11	IV. 12.
columella *Say.*		IV. 11, 12.
columnaris *Lam.*		V. 52.
curta *Lea.* (Feb. 19, 1841.)	IV. 11	XI. 119.
desidiosa *Say.*		IV. 10, 11.
elodes *Say.*		IV. 9.
exigua *Lea.* (Feb. 19, 1841.)	IV. 9	IV. 10: XI. 111, 118.
exilis *Lea.* (April 18, 1834.)	I. 226	
fusiformis *Lea.* (Feb. 19, 1841.)	IV. 10	
Griffithiana *Lea.* (Feb. 19, 1841.)	IV. 8	
Haydenii *Lea.* (July 6, 1858.)	XI. 115	XI. 117.
imperialis *Lea.* (Mar. 15, 1833.)	I. 193	
Jamesii *Lea.* (April 19, 1864.)	XI. 117	

LYMNÆA.	Description.	Miscellaneous References.
Kirtlandiana *Lea.* (Feb. 19, 1841.)	IV. 12	
Lecontii *Lea.* (April 19, 1864.)	XI. 118	
modicellus *Say.*		IV. 8, 12.
Nuttalliana *Lea.* (Feb. 19, 1841.)	IV. 9	XI. 116.
pallida *Adams.*		XI. 111, 118.
parva *Lea.* (Feb. 19, 1841.)	IV. 11	
Philadelphica *Lea.* (Feb. 19, 1841.)	IV. 8	
Pingelii *Beck.*		XI. 116.
planulata *Lea.* (Feb. 19, 1841.)	IV. 9	
plica *Lea.* (Feb. 19, 1841.)	IV. 10	IV. 8, 9: XI. 118.
proxima *Lea.* (April 1, 1856.)	XI. 116	
reflexa *Say.*		I. 227: IV. 12.
rubella *Lea.* (Feb. 19, 1841.)	IV. 12	
rustica *Lea.* (Feb. 19, 1841.)	IV. 10	
Smithsoniana *Lea.*	XI. 117	
solida *Lea.* (Nov. 4, 1836.)	II. 94	
stagnalis *Lin.*		IV. 8.
strigosa *Lea.* (Feb. 19, 1841.)	IV. 12	
Traskii *Lea.* (April 19, 1864.)*		XI. 118.
Tryoniana *Lea.* (April 19, 1864.)	XI. 118	
umbilicata *Adams.*		XI. 117, 118.
MEGASYSTROPHA.		
Newberryi *Lea.* (Jan. 12, 1864.)	XI. 109	
PHYSA.		
acuta *Drap.*		XI. 125.
Altonensis *Lea.* (April 19, 1864.)	XI. 120	
anatina *Lea.* (April 19, 1864.)	XI. 127	
ancillaria *Say.*		XI. 121, 127.
aurea *Lea.* (Dec. 19, 1834.)	II. 18	II. 92: IV. 8: XI. 131.
Blandii *Lea.* (April 19, 1864.)	XI. 124	XI. 131.
brevispira *Lea.* (April 19, 1864.)	XI. 129	
crocata *Lea.* (April 19, 1864.)	XI. 125	
Dorbignyana *Lea.* (April 19, 1864.)	XI. 122	
elliptica *Lea.* (April 18, 1834.)	I. 227	XI. 121, 125, 126, 130, 131.
Febigerii *Lea.* (April 19, 1864.)	XI. 130	
fontana *Hald.*		XI. 133.
fontinalis *Pfr.*		XI. 130.

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* [Changed to Tryoniana.]

PHYSA.	Description.	Miscellaneous References.
Forsheyi *Lea.* (April 19, 1864.)	XI. 128	
fragilis *Mighels.*		XI. 119.
globosa *Hald.*		XI. 130.
Grosvenorii *Lea.* (April 19, 1864.)	XI. 131	
gyrina *Say.*		XI. 126.
Halei *Lea.* (April 19, 1864.)	XI. 121	XI. 126.
Hawnii *Lea.* (April 19, 1864.)	XI. 121	
heterostropha *Say.*		IV. 7: XI. 111, 112, 119, 121, 122, 124, 129.
Hildrethiana *Lea.* (Feb. 19, 1841.)	IV. 7	XI. 121.
hordacea *Lea.* (April 19, 1864.)	XI. 132	XI. 133.
inflata *Lea.* (Feb. 19, 1841.)	IV. 7	XI. 129.
microstoma *Hald.*		XI. 124.
Niagarensis *Lea.* (April 19, 1864.)	XI. 129	XI. 131.
Nicklinii *Lea.* (April 19, 1864.)	XI. 131	
Nuttallii *Lea.* (April 19, 1864.)	XI. 127	
parva *Lea.* (April 19, 1864.)	XI. 133	
Saffordii *Lea.* (April 19, 1864.)	XI. 123	XI. 122.
Showalterii *Lea.* (April 19, 1864.)	XI. 126	XI. 128, 131.
Smithsoniana *Lea.* (April 19, 1864.)	XI. 125	
striata *Lea.* (April 19, 1864.)*		XI. 122.
tenuissima *Lea.* (April 19, 1864.)	XI. 123	
Traskii *Lea.* (April 19, 1864.)	XI. 119	
triticea *Lea.* (April 1, 1856.)	XI. 132	
Troostiana *Lea.* (Feb. 19, 1841.)	IV. 7	XI. 125: XI. 133.
venusta *Lea.* (April 19, 1864.)	XI. 124	
virginea *Gould.*		XI. 120.
Warreniana *Lea.* (April 19, 1864.)	XI. 120	XI. 119.
Whitei *Lea.* (April 19, 1864.)	XI. 128	
PLANORBIS.		
armigerus *Say.*		XI. 114.
ammon *Gould.*		XI. 111.
bellus *Lea.* (Feb. 19, 1841.)	IV. 6	
bicarinatus *Say.*		XI. 114.
Billingsii *Lea.* (April 19, 1864.)	XI. 115	
Brogniartiana *Lea.*		IV. 24.
Buchanensis *Lea.* (Feb. 19, 1841.)	IV. 6	
corpulentus *Say.*		XI. 113.
lens *Lea.* (July 15, 1836.)	II. 68	IV. 24.
lenticularis *Lea.*		IV. 6.

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* [Changed to Dorbignyana.]

PLANORBIS.	Description.	Miscellaneous References.
Newberryi *Lea.* (Mar. 23, 1858.).....*	....	XI. 109.
regularis *Lea.* (Feb. 19, 1841.)........	IV. 6	
Traskii *Lea.* (April 1, 1856.)..........	XI. 113	
trivolvis *Say*.........................	....	IV. 6: XI. 111.
Wheatleyi *Lea.* (Mar. 23, 1858.)......	XI. 114	
POMPHOLIX.		
effusa *Lea.* (April 1, 1856.)............	XI. 112	

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* [Changed to Megasystropha Newberryi.]

SECTION VII.

COLIMACES.

SUBSECTIONS { ACHATINA, AURICULA, BULIMUS, CYCLOSTOMA,

SUBSECTIONS { HELICINA, HELIX (POLYGYRA and CAROCOLLA), MEGASPIRA, SUCCINEA.

ACHATINA.	Description.	MISCELLANEOUS REFERENCES.
columella (**LYMN.**) *Lam.*	....	V. 52.
flammata *Caill.*	....	IV. 2.
folliculatus *Lam.*	....	IV. 3.
striata *Lea.* (Feb. 19, 1841.)	IV. 3	
turbinata *Lea.* (Feb. 19, 1841.)	IV. 2	
Vanuxemensis *Lea.* (Mar. 15, 1833.)	I. 196	
AURICULA.		
fuscagula *Lea.* (Mar. 15, 1833.)	I. 195	
BULIMUS.		
Columbianus *Lea.* (July 15, 1836.)	II. 66	
corneus *Lea.* (July 15, 1836.)	II. 66	
decollatus *Lin.*	....	IX. 55.
decoratus *Lea.* (Nov. 4, 1836.)	II. 86	
Gibbonius *Lea.* (Nov. 4, 1836.)	II. 85	
glandiformis *Lea.* (Nov. 4, 1836.)	II. 83	
gracilis *Lea.* (Nov. 4, 1836.)	II. 85	
Jayanus *Lea.* (Feb. 19, 1841.)	IV. 2	
lacteus *Lea.* (July 15, 1836.)	II. 65	II. 67.
maculatus *Lea.* (Nov. 4, 1836.)	II. 86	II. 84.
octonus *Rang.*	....	IV. 3.
parvus *Lea.* (Nov. 4, 1836.)	II. 84	

BULIMUS.	Description.	Miscellaneous References.
Pealianus *Lea.* (July 15, 1836.)	II. 65	
virgo *Lea.* (Nov. 4, 1836.)	II. 84	
CYCLOSTOMA.		
Cincinnatiensis *Lea.* (Oct. 2, 1840.)	III. 67	
Jamaicensis *Fer.*		I. 196.
maculata *Lea.* (July 15, 1836.)	II. 68	
Popayana *Lea.* (Nov. 4, 1836.)	II. 94	
striata *Lea.* (Mar. 15, 1833.)	I. 196	II. 94.
HELICINA.		
lens *Lea.* (Mar. 16, 1832.)	I. 161	
pulcherrima *Lea.* (Mar. 16, 1832.)	I. 161	
virginea *Lea.* (Mar. 16, 1832.)	I. 162	
HELIX.		
alternata *Say.*		III. 67.
Californiensis *Lea.* (July 21, 1837.)	II. 99	XI. 111.
Carolinensis *Lea.* (May 7, 1830.)	I. 112	I. 113: II. 100.
cincta *Lea.* (Mar. 16, 1832.)	I. 168	
citrina *Lam.*		I. 167.
Clarkii *Lea.* (Mar. 23, 1858.)	XI. 138	
Columbiana *Lea.* (Nov. 4, 1836.)	II. 89	
concava *Say.*		II. 88.
Couchiana (**POL.**) *Lea.* (April 7, 1857.)	XI. 139	XI. 140.
Cumberlandiana (**CAR.**) *Lea.* (Oct. 2, 1840.)	III. 67	
cyclostomopsis *Lea.* (Mar. 16, 1832.)	I. 165	
diaphana *Lea.* (Mar. 16, 1832.)	I. 166	
Dorfeuilliana (**POL.**) *Lea.* (Jan. 5, '38.)	II. 107	II. 108: V. 60.
Edgariana (**CAR.**) *Lea.* (Feb. 19, 1841.)	IV. 2	V. 60.
fatigiata (**POL.**) *Say.*		II. 107, 108: V. 60, 61.
globula *Lea.* (Mar. 16, 1832.)	I. 170	I. 169.
helicoides (**CAR.**) *Lea.* (May 7, 1830.)	I. 113	
Himalana *Lea.* (Mar. 16, 1832.)	I. 167	
hirsuta *Say.*		I. 114: IV. 2: V. 59, 60.
Hydiana (**CAR.**) *Lea.* (July 21, 1837.)	II. 98	
inflecta *Say.*		V. 59.

HELIX.	Description.	Miscellaneous References.
jejuna *Say*.		II. 87: IV. 17.
labyrinthica (**CAR.**) *Lam*.		II. 98.
labyrinthica *Say*.		IV. 18.
lævipes *Fer*.		I. 167.
Leai *Ward*.		V. 59, 60.
Lecontii *Lea*. (Mar. 5, 1852.)	V. 59	V. 60.
leporina *Gould*.		V. 60.
limbata *Drap*.		IV. 1.
magnifica *Lea*. (Nov. 4, 1836.)	II. 89	
mamilla *Lea*. (Mar. 16, 1832.)	I. 166	I. 164.
minutissima *Lea*. (June 18, 1841.)	IV. 17	
Mitchelliana *Lea*. (Nov. 4, 1836.)	II. 87	
Mobiliana *Lea*. (June 18, 1841.)	IV. 17	
monodon *Rackett*.		V. 60.
monodonta *Lea*. (Mar. 16, 1832.)	I. 165	
muscarum *Lea*. (Mar. 16, 1832.)	I. 163	
Nickliniana *Lea*. (July 21, 1837.)	II. 100	XI. 111.
Nuttalliana *Lea*. (Nov. 4, 1836.)	II. 88	
Oregonensis *Lea*. (July 21, 1837.)	II. 100	XI. 111.
ovum-reguli *Lea*. (Mar. 16, 1832.)	I. 164	
palliata *Say*.		I. 112, 113: XI. 139.
pellis-serpentis *Lam*.		II. 90.
Pennsylvanica *Green*.		XI. 138.
plicata (**POL.**) *Say*.		II. 107, 108: V. 60, 61.
plicata *Wood*.		II. 98.
purpuragula *Lea*. (Mar. 16, 1832.)	I. 163	
solitaria *Say*.		II. 88.
spinosa (**CAR.**) *Lea*. (May 7, 1830.)	I. 114	IV. 2: V. 60.
Tamaulipasensis (**POL.**) *Lea*. (April 7, 1857.)	XI. 139	
Tennesseensis *Lea*. (Feb. 19, 1841.)	IV. 1	
thyroideus *Say*.		II. 89, 99.
Townsendiana *Lea*. (July 21, 1837.)	II. 99	
Troostiana (**POL.**) *Lea*. (Jan. 5, 1838.)	II. 107	V. 60: XI. 139, 140.
Vancouvrensis *Lea*. (Nov. 4, 1836.)	II. 87	
vesica *Lea*. (Mar. 16, 1832.)	I. 168	
Wardiana *Lea*. (July 15, 1836.)	II. 67	
Woodiana *Lea*. (Mar. 16, 1832.)	I. 169	
MEGASPIRA.		
Ruschenbergiana *Lea*. (Sept. 18, 1835.)	II. 21	
SUCCINEA.		
aperta *Lea*. (July 21, 1837.)	II. 101	
aurea *Lea*. (Feb. 19, 1841.)	IV. 4	IV. 5: XI. 136.

SUCCINEA.	Description.	Miscellaneous References.
campestris *Say*.		IV. 6 : XI. 136.
Candeana *Lea*. (Feb. 19, 1841.)	IV. 5	
concordialis *Gould*.		XI. 134.
Dorbignyana *Lea*.		IV. 4.
Forsheyi *Lea*. (April 12, 1864.)	XI. 134	
fulgens *Lea*. (Feb. 19, 1841.)	IV. 5	
gracilis *Lea*. (Feb. 19, 1841.)	IV. 3	
Grosvenorii *Lea*. (April 12, 1864.)	XI. 135	
Halei *Lea*. (April 12, 1864.)	XI. 136	
Haydenii *W. G. Binney*.		XI. 134.
inflata *Lea*. (Feb. 19, 1841.)	IV. 5	
lineata *W. G. Binney*.		XI. 135, 136
luteola *Gould*.		XI. 136.
Mooresiana *Lea*. (April 12, 1864.)	XI. 135	
Nuttalliana *Lea*. (Feb. 19, 1841.)	IV. 4	IV. 3.
obliqua *Say*.		IV. 4.
Oregonensis *Lea*. (Feb. 19, 1841.)	IV. 5	XI. 136.
ovalis *Say*.		IV. 5.
pellucida *Lea*. (April 12, 1864.)	XI. 134	
putris *Drap*.		IV. 4.
retusa *Lea*. (April 18, 1834.)	I. 229	IV. 4 : XI. 134.
Totteniana *Lea*. (Feb. 19, 1841.)	IV. 4	
vermeta *Say*.		IV. 4 : XI. 134.
Wardiana *Lea*. (Feb. 19, 1841.)	IV. 3	XI. 134.
Wilsonii *Lea*. (April 12, 1864.)	XI. 133	XI. 135.

SECTION VIII.

MISCELLANEOUS AND UNCLASSIFIED REFERENCES.

ALPHABETICALLY ARRANGED.

UNCLASSIFIED SUBJECTS.	MISCELLANEOUS REFERENCES.
Accessory column or fulcrum of **Colimaces.**	V. 60.
Aphrodite columba *Lea.* (Feb. 7, 1834.)	I. 223.
Buccinum striatum *Chem.*	I. 197.
Cooper, William. Letter of	I. 21.
California. Shells of	XI. 111.
Catalogue of the Genus **Melania.**	IV. 70.
Cochlicopea rosea *Fer.*	I. 197.
Cyrena Jayensis *Lea.* (Feb. 7, 1834.) Description.	I. 220.
Cyrena papua *Lesson.*	I. 221, 222.
Cyrena rotundata *Lea.* (Feb. 7, 1834.) Description.	I. 219.
Cyrena turgida *Lea.* (Feb. 7, 1834.) Description.	I. 221.
Cyrena Woodiana *Lea.* (Feb. 7. 1834.) Description.	I. 222.
Cyrena Zeylonica *Lam.*	I. 220, 221.
GENERA AND SUBGENERA.	
Alasmodon *Swainson.*	II. 115.
Alasmodonta *Say.*	I. 43, 57, 117.
Amnicola *Gould & Haldeman.*	IV. 16: IX. 40, 91.
Anculosa *Say.*	III. 1: IV. 14: IX. 40, 168.
Anculotus *Say.*	IV. 14.
Anodon *Swainson.*	II. 115.
Anodonta *Lamarck.*	I. 57: II. 114, 115, 117, 218—Soft parts: X. 82.
Aphrodite *Lea.* (Feb. 7, 1834.)	I. 223.
Basistoma *Lea.* (Mar. 5, 1852.)	V. 51.
Bifrontia *Deshayes.*	IX. 67.
Carocolla *Lam.*	IV. 1.
Castalia *Lam.*	I. 56, 57, 117: II. 109.
Ceriphasia *Swainson.*	IX. 91.
Clathrodon.	VI. 38.
Clausilia.	I. 95.
Chilina *Gray.*	IX. 79.
Cyrena.	I. 219: VI. 38.

Unclassified Subjects.	Miscellaneous References.
Damalis *Leach.*	II. 134.
Dipsas *Leach.*	I. 56, 57: II. 114, 117, 118.
Elimia *Adams.*	IX. 40.
Euomphalus *Sowerby.*	IX. 67.
Eurycœlon *Lea.* (Jan. 12, 1864.)	XI. 106.
Galathea.	I. 190.
Glandina *Schum.*	I. 197.
Goniobasis *Lea.* (May 27, 1862.)	IX. 39, 40, 118.
Gyrotoma *Shuttleworth.*	IX. 67.
Helix *Lamarck.*	IV. 1.
Hyria *Lamarck.*	I. 56, 57: II. 109, 115.
Io *Lea.* (Jan. 7, 1831.)	I. 132: IV. 17: IX. 40, 84, 91, 167, 168.
Iridina *Lamarck.*	I. 56, 57: II. 114, 115, 117, 118: XI. 40.
Lithasia *Haldeman.*	IX. 40, 91, 168.
Lymnæa *Lamarck.*	IV. 8.
Macrolimen *Lea.* (June 3, 1862.)	IX. 43.
Mactra.	I. 190.
Margarita.	II. 117, 218.
Margaritana *Schum.*	I. 44: II. 114, 118: VI. 37, 38.
Margaritifera *Fer.*	II. 117.
Megasystropha *Lea.* (Jan. 12, 1864.)	XI. 110.
Melania *Lam.*	III. 1: IX. 40, 168.
Melanopsis.	V. 51.
Melatoma *Anth.*	IX. 67.
Melatoma *Swains.*	V. 51: IX. 67.
Meseschiza *Lea.* (Jan. 12, 1864.)	XI. 108.
Neritina *Lam.*	IX. 89.
Pachychilus *Lea.*	XI. 77.
Paludina *Lam.*	IV. 13: IX. 91.
Paxyodon *Schum.*	I. 57.
Physa *Lam.*	IV. 7.
Pirena *Lam.*	V. 51.
Plagiodon *Lea.* (April 1, 1856.)	VI. 37.
Planorbis *Lam.*	IV. 6.
Platiris *Lea.*	II. 117, 118.
Pompholix *Lea.* (April 1, 1856.)	XI. 112.
Schizochilus *Lea.* (Mar. 5, 1852.)	V. 51: IX. 67.
Schizostoma *Lea.* (Dec. 16, 1842.)	IV. 26: IX. 40, 67, 68.
Spatha *Lea.*	II. 114, 118: XI. 40, 41.
Strephobasis *Lea.* (April 16, 1861.)	IX. 40, 86, 177.
Strophitus *Agass.*	X. 86.
Succinea *Drap.*	IV. 3.
Symphynota *Lea.* (Mar. 6, 1829.)	I. 56: II. 115.
Tellescopia *Gray.*	IX. 91.
Triquetra *Klein.*	II. 117.
Trypanostoma *Lea.* (April 15, 1862.)	IX. 90, 91, 172: XI. 108.
Unio *Brug.*	I. 2, 56, 57, 113, 115: II. 117, 118: VI. 37, 38.

Unclassified Subjects.	Miscellaneous References.
Helices of the United States: their color	IV. 1.
Lymneana	XI. 111.
Melaniana	I. 137: IV. 24: IX. 39, 40.
Melaniana, grouped by external characters	III. 1.
Melaniana. Observations on	IV. 24: V. 51: IX. 39.
Patella amœna *Say*	XI. 142.
Patelloidea testudinaria *Lea*	XI. 142.
Peristomiana	I. 137, 139.
Pupa crysalis *Fer*	IX. 54.
Succinea. Opinions of Binney, Gould & Binney, reviewed.	XI. 137.
Trochus agglutinans *Lam*	I. 115.
Trochus conchyliophorus	I. 115.
Unio. Etymology	I. 6.
Use of proper names, in nomenclature of species	V. 61.
UNIONIDÆ.	
"Anterior and posterior," anatomically considered.	I. 3.
Beaks of	I. 27.
Branchial, uterus of	VI. 43.
Byssus of	VI. 51: X. 46.
Color of	I. 23.
Classification, nomenclature, and synonymy of	I. 29: II. 121.
Diversity of forms of	I. 20.
Epidermal colors of	I. 25.
Embryonic young of	VI. 43 to 50.
Exotic species of	X. 12.
Fossil species of	II. 151.
Geographical distribution of	II. 145.
Grouped by external characters	II. 119.
Habits of	I. 3, 75.
Hook or spur of embryo of	VI. 44, 45.
Ligaments of	I. 29.
Lamarck's species of	I. 35, 198.
List of authors on	II. 152.
Muscular impressions of	I. 28.
Number of species of. Introduction vols	VII., VIII., IX.
Observations on	I. 73, 135: II. 48: VI. 51: VII. 9.
Observations on exotic species	VII. 53.

Unclassified Subjects.	Miscellaneous References.
UNIONIDÆ.	
Ova of	III. 69.
Oviducts of	II. 49 to 57.
Rafinesque's species. Remarks on	II. 120.
Rafinesque's species. Undetermined	II. 144.
Superficial elevations of	I. 24.
Size of	I. 116.
Sex of	II. 49.
Species undetermined	II. 151.
Soft parts and embryonic young of	X. 37.
Teeth of	I. 21.
Visual organs of	VI. 51.

ERRATA ET CORRIGENDA OF VOLS. I. TO XI.

Vol. I.

Page 2, line 1, for *Bruguières* read *Retzius*.
“ 20, “ 4 from bottom, for *peruvianus* read *plicatus*.
“ 31, “ 4 and 5 from bottom, for *peruvianus* read *plicatus*.
“ 38, “ 4, *for* made the type *read* placed in.
“ 40, “ 3 from bottom, after volume *read* 3d Trans. Am. Phil. Soc.
“ 53, “ 2, *for* angusto-elliptica *read* lata, and in lines 6 and 15 *for* long elliptical *read* wide.
“ 77, “ 4 from bottom, *for* V. 3d, p. 442, *read* ante, p. 56.
“ 78, “ 1 from bottom, *for* Transactions, V. 3d, *read* ante, p. 31.
“ 83, “ 1 from bottom, *for* V. 3d, p. 416, *read* ante p. 30.
“ 84, “ 5, *for* divided *read* undivided.
“ 85, “ 11, *for* Ohio *read* Cumberland River.
“ 99, “ 4, *for* angusto-elliptica *read* lævi, transversa; and alter the translation.
“ 117, “ 14, *for* V. 3d, p. 442, *read* ante, p. 56.
“ 117, “ 2 from bottom, *for* V. 4th, p. 90, *read* ante, p. 100; and for Vol. 3d, p. 424, *read* ante, p. 38.
“ 123, “ 1 from bottom, *for* V. 3d, p. 448, *read* ante, p. 32.
“ 127, “ 1 from bottom, *for* V. 3d, p. 431, *read* ante, p. 45.
“ 140, “ 8, *for* China *read* Moctizuma River, Cent. Am.
“ 160, “ 4, for *palna* read *plana*.
“ 183, “ 12 from bottom, for *Troostensis* read *Troostii*.
“ 185, “ 12 from bottom, for *obovatus* read *subovatus*.
“ 208, “ 13 from bottom, *after* Hab. *read* Catawba River, N. C.
“ 216, “ 8 from bottom, for *Benedictensis* read *Benedictii*.
“ 224, “ 7 from bottom, for *fluviatilis* read *fluvialis*.

Vol. II.

Page 3, line 8, *before* cabinet *insert* my cabinet, &c.
“ 20, “ 6, for *plicata* read *Menkiana*.
“ 21, “ 10, *before* cannot *insert* it.
Page 29, line 9 from bottom, *after* testâ *insert* lævi.
“ 30, “ 14, *for* Cowper *read* Couper.
“ 36, “ 1, *for* Vanuxemensis *read* Vanuxemii.
“ 42, “ 9, *before* cabinet *insert* my cabinet, &c.
“ 49, “ 17, *for* is *read* in.
“ 49, “ 19, *for* examination *read* examinations.
“ 57, “ 14, *for* Cowper *read* Couper.
“ 59, “ 7, *for* left *read* right.
“ 59, “ 17, *for* forms *read* performs.
“ 61, “ 15 from bottom, *for* Cowper *read* Couper.
“ 68, “ 10 from bottom, for *lens* read *lenticularis*.
“ 74, “ 10 from bottom, *for* India *read* Moctizuma, Mexico.
“ 95, “ 3, *after* testa *insert* lævi.
“ 96, “ 8, for *Pepinianus* read *Pepiniana*.
“ 104, “ 14, *for* elliptica *read* lata.

Vol. III.

In Table of Contents *for* Dec. 1 *read* Dec. 21.
Page 3, line 1, *change* lævigata *to* lævis.
“ 5, “ 8, *change* rufa *to* rufescens.
“ 14, “ 15, *for* plicata *read* lævi.
“ 15, “ 10 from bottom, *change* corrugata *to* rugosa.
“ 20, “ 13, *change* plicatula *to* Deshayesiana.
“ 21, “ 3 from bottom, *change* exarata *to* arata.
“ 21, “ 2 from bottom, *for* nigra *read* cornea.
“ 21, “ 1 at bottom *for* tenebrosa *read* albida.
“ 22, “ 1, *for* black *read* horn color.
“ 22, “ 7, *leave out* its jelly hue.
“ 24, “ 5, *for* striata *read* striatula.
“ 34, “ 3, *for* Cany *read* Caney et sequiter.
“ 48, “ 1, leave out comma after French.
“ 60, “ 10, *change* Margaritana *to* Monocondylœa.
“ 64, “ 9, *for* Maryattana *read* Marryatana.
“ 77, “ 2, *after* testa *insert* lævi.
“ 80, “ 3, *after* testa *insert* lævi.
“ 82, “ 14, *for* mœtus *read* mœstus.

Vol. IV.

Page 6, line 20 from bottom, *for* Buchanensis *read* Buchananii.
“ 17, “ 5, *for* fluviatilis *read* fluvialis.
“ 39, “ 14, *after* alata *insert* lævi.
“ 39, “ 15, *for* perlongis read prælongus.
“ 40, “ 8, *after* Hab. *insert* Lake Nicaragua, Dr. Genth.

Page 49, line 15, *for* lævi, obliqua, *read* subnodulosa, subrotunda.
" 51, " 7, *for* lævi *read* sulcata.
" 55, " 12 from bottom, *for* elliptica *read* subobliqua.
Pages 67, 68, and 69, *for* Tuscaloosa *read* Coosa.

Vol. V.

Page 10, line 1, *for* sordidis *read* sordidus.
" 16, " 6, *for* elliptica *read* oblonga.
" 37, " 6 and 38, *for* Keinerianus *read* Kienerianus.
" 39, " 1, *for* elliptica *read* oblonga.
" 44, " 17 from bottom, *for* Shaefferiana *read* Shafferiana.
" 45, " 9, *for* Linnæna *read* Linnæana.
" 59, " 3, *insert* Read, March 6, 1852.
" 62, " 16, *for* Keinerianus *read* Kienerianus.
On plate 26, *for* Troutwiniana *read* Trautwiniana.

Vol. VI.

Page 11, line 3 from bottom, *for* brevis *read* brevibusque.
" 14, " 7, *change* tuberculata *to* plicata.
" 16, " 14, *change* tubercles *to* folds.
" 17, " 11, *for* undulatus *read* undulatis.
" 17, " 12, *for* brevis *read* brevibus, *and for* uteroque *read* utroque.
" 21, " 3 from bottom, *for* Verreauianus *read* Verreauxianus; also change on plate 27.
" 39, " 7 from bottom, *for* Mr. Asa Fitch *read* Dr. Asa Fitch; same on pages 40 and 51.
" 86, " 13, *change* elliptica *to* oblonga.
" 88, " 2, *change* elliptica *to* oblonga.
" 90, " 2, *change* elliptica *to* oblonga.
" 91, " 2, *change* elliptica *to* oblonga.
On plate 32, *for* isocardiodes *read* isocardioides.
" 5, fig. 7, *for* Lea *read* Lam.
" 27, *for* Verreauianus *read* Verreauxianus.

Vol. VII.

Page 33, line 13, *for* inequilaterali *read* inæquilaterali.
" 45, " 4, *for* Monocondylæa *read* Monocondylœa.
" 45, " 5, *change* Etowahensis *to* Georgiana, and following on this and page 46.
" 50, " 15 from bottom, *for* Georgia *read* Alabama.
" 63, " 7, *for* nobis *read* Spix.
" 83, " 2, *for* lateral *read* cardinal.
" 85, last line, *insert* Unio *before* Scamnatus.
In Index, line 16 from bottom, *for* 67 *read* 68.

Vol. VIII.

Page 15, line 14, *for* inusitatis *read* inusitatus, and on plate 52.
" 18, " 5 from bottom, *change* latè elliptica *to* lata.
Page 27, line 19, *for* virido *read* viridi.
" 29, " 11, *insert* me *before* is.
" 37, " 10 from bottom, *for* paliatus *read* palliatus.
" 43, " 15, *for* specimens *read* specimen.
" 44, " 20, *for* tenebrosâ *read* tenebroso.
" 57, " 11, *change* quadratâ *to* oblongâ.
" 58, " 10, *change* quadratâ *to* oblongâ.
" 63, " 2, *change* quadratâ *to* oblongâ.
" 63, " 4 from bottom, *for* posticè *read* anticè.
" 72, " 13 from bottom, *for* herein described *read* described in Vol. XI.
On plate 12, *for* trinacris *read* trinacrus.

Vol. IX.

Page 31, line 10 from bottom, *change* latè elliptica *to* latâ.
" 39, " 12 from bottom, *for* spirans *read* spiram.
" 39, " 13 from bottom, *for* fusiformi *read* fusiformis.
" 41, " 11 from bottom, *for* 1.4 *read* 1.04.
" 48, " 8 from bottom, *for* nebula *read* nubila.
" 54, " 6, for 1.2 read 1.02.
" 56, " 11 from bottom, *for* 1.2 *read* 1.02.
" 58, " 10, *for* 1.1 read 1.01.
" 64, " 1, and on plate 35, *change* blanda *to* versa.
" 66, " 18, *for* paulisper *read* aliquanto.
" 68, " 7 from bottom, *leave out* at Uniontown.
" 70, " 20, *for* about *read* above.
" 82, " 2 and 13, *for* semigranata *read* semigranulosa.
" 95, " 21, *for* 1.8 *read* 1.08.
" 98, " 5, *for* Trypanostoma *read* Goniobasis.
" 100, " 3 and 8, *for* bivittata *read* bivittatum.
" 112, " 12, *for* Trypanostoma *read* Goniobasis.
" 129, " 9, *change* Vanuxemii *to* Prestoniana.
" 147, " 3 and 20, *for* plicata *read* plicatis.
" 167, " 9 from bottom, *for* fluviatilis *read* fluvialis.
Plate 35, fig. 79, *for* crenatula *read* crenatella.
" 36, " 112, *for* Florencese *read* Florencence.
" 37, " 147, *for* Spartenbergensis *read* Spartanbergensis.
In the Index several Tryphanostomæ are out of alphabetical order.

Vol. X.

Page 17, line 9 from bottom, *leave out* lævi.
" 25, " 7 from bottom, *change* lepidus *to* lepidior.
" 25, " 6 from bottom, *change* elliptica *to* oblonga.
In Index, *transfer* occatus from list of Anodonta to list of Unio.

Vol. XI.

Page 57, line 13 from bottom, *change* quadrata *to* oblonga.
" 59, " 13, *for* vasus *read* rasus.
" 60, " 13, *for* M *read* U.

APPENDIX.

THE following species have been described by me and published in the "Proceedings of the Academy of Natural Sciences," and will appear in my volume 12th of "*Observations on the Genus Unio*," &c., with full diagnoses and figures as heretofore.

Genus **UNIO.**

U. acutirostris (Mar. 20, 1866). South America.
U. amabilis (May 16, 1865). Georgia.
U. ampullaceus (Mar. 20, 1866). South America.
U. apprimus (Mar. 20, 1866). South America.
U. asperulus (May 15, 1866). Siam.
U. Bisselianus (May 21, 1867). North Carolina.
U. Clinchensis (May 21, 1867). Tennessee.
U. Cromwellii (May 16, 1865). Georgia.
U. doliaris (May 16, 1865). Georgia.
U. Emesaensis (Dec. 20, 1864). North Syria.
U. evitatus (May 15, 1866). Mexico.
U. firmus (Mar. 20, 1866). South America.
U. Homsensis (Dec. 20, 1864). North Syria.
U. Jewettii (May 21, 1867). Florida.
U. Kullethensis (Dec. 20, 1864). River Tigris.
U. locellus (Mar. 20, 1866). South America.
U. Lyonii (May 16, 1865). Tennessee.
U. Mardinensis (Dec. 20, 1864). River Tigris.
U. marginis (Dec. 16, 1865). Georgia.
U. Orphaensis (Dec. 20, 1864). River Tigris.
U. parcus (Mar. 20, 1866). South America.
U. Paraguayensis (Mar. 20, 1866). South America.
U. peculiaris (Mar. 20, 1866). South America.
U. pilatus (May 15, 1866). Siam.
U. proprius (May 16, 1865). Georgia.
U. protensus (May 16, 1865). North Carolina.
U. punctatus (May 16, 1865). Tennessee.
U. rufofuscus (April 18, 1865). ———?
U. rugososulcatus (Mar. 20, 1866). South America.
U. Siamensis (May 15, 1866). Siam.
U. Strebellii (May 15, 1866). Mexico.
U. tortuosus (April 18, 1865). China.
U. Wrightii (April 18, 1865). China.

Genus **MARGARITANA.**

M. Columbensis (May 21, 1867). Mississippi.

Genus **MONOCONDYLŒA.**

M. lentiformis (Mar. 20, 1866). South America.
M. Mardinensis (Dec. 20, 1864). River Tigris.
M. Pazii (Mar. 20, 1866). South America.

Genus **ANODONTA.**

A. Pazii (Mar. 20, 1866). South America.
A. Youcanensis (May 21, 1867). Arctic America.

Genus **LITHASIA.**

L. cylindrica (May 15, 1866). Alabama.
L. Wheatleyi (May 15, 1866). Alabama.

Genus **PALUDINA.**

P. Spillmanii (May 15, 1866). Alabama.

INDEX

TO VOL. XII.

AND SUPPLEMENTARY INDEX TO VOLS. I. TO XI. OF

OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTION OF NEW SPECIES OF THE FAMILY UNIONIDÆ,

AND

DESCRIPTION OF NEW SPECIES OF THE MELANIDÆ, PALUDINÆ, HELICIDÆ, ETC.

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY AND THE ACADEMY OF NATURAL
SCIENCES OF PHILADELPHIA, FROM 1827 TO 1868.

BY

ISAAC LEA, LL. D., ETC.

VOL. II.

PHILADELPHIA:
PRINTED FOR THE AUTHOR
BY T. K. COLLINS, 705 JAYNE STREET.
1869.

NOTICE.

The index which I published, in 1867, of the eleven volumes of my Observations on the Genus *Unio*, etc., has proved so useful for reference to the Genera and Species described by me, I am induced to continue it for Vol. XII., and to issue with it an index of the *subject-matter* of the whole twelve volumes. I have also included tables of Errata and Corrigenda, that the whole may be made as complete and useful to the student of this interesting branch of Zoology as possible.

For the forming and classifying of these extensive tables I am indebted to my friend James Lewis, M.D., of Mohawk, N. Y., who so ably aided me in the previous Index.

All papers embraced in the twelfth volume are included and taken from the "Journal of the Academy of Natural Sciences," Vol. VI., and may be referred to there as well as in my Vol. XII.

ORDER OF ARRANGEMENT.

The systematic order of arrangement which has been partially adopted in compiling this index, it is believed, will be found much more convenient for consulting so large a mass of matter as is herein referred to, than a formal alphabetical arrangement that necessitates the promiscuous mingling of subjects that have no systematic relations with each other.

Section I. embraces new species of North American *Unionidæ*, original descriptive matter, and miscellaneous references to the same species in Vol. XII., in continuation of Section I., Index to Vols. I. to XI.
Subsections—UNIO, MARGARITANA, ANODONTA.

Section II. embraces new species of *Unionidæ* of Mexico and Central America, original descriptive matter, and miscellaneous references to the same species in Vol. XII., in continuation of Section II., Index to Vols. I. to XI.
Subsections—UNIO, ANODONTA.

Section III. embraces new species of Exotic *Unionidæ*, original descriptive matter, and references to the same species in Vol. XII., in continuation of Section III., Index to Vols. I. to XI.
Subsections—UNIO, ANODONTA, MONOCONDYLŒA, MYCETOPUS.

Section IV. embraces Miscellaneous *Unionidæ*, etc. (genera and species), to which incidental references have been made in classifying and comparing species under description, in Vol. XII., in continuation of Section IV., Index to Vols. I. to XI.
Subsections—ANODONTA, *ARCA*, CASTALIA, DIPSAS, IRIDINA, MONOCONDYLŒA, MYCETOPUS, PRISODON, SPATHA, TRIQUETRA.

Section V. embraces Operculated Univalve Aquatic *Mollusca* in Vol. XII., in continuation of Section V. Index to Vols. I. to XI.
Part A. embraces new species only, and miscellaneous references to the same.
Part B. embraces miscellaneous species, subjects of incidental remarks in classifying and comparing species under description.
Subsections—ANCULOSA, GONIOBASIS, LITHASIA, PALUDINA, SCHIZOSTOMA, TRYPANOSTOMA.

Section VI. embraces *subject-matter* (not necessarily descriptive or comparative of species) in the series of volumes from I. to XII. alphabetically arranged. Nearly all that refers to Vols. I. to XI. is supplementary, and will not be found in the previous index.

Section VII. embraces ERRATA and CORRIGENDA.
Part A. is supplementary to the table of "Errata and Corrigenda" of Vols. I. to XI. in the index to those volumes.
Part B. embraces ERRATA and CORRIGENDA of Vol. XII.
Part C. embraces ERRATA and CORRIGENDA of Index to Vols. I. to XI.

⁂ [As in the Index to Vols. I. to XI. the dates of the *first publication* of "new species" are placed against the names of the species.]

SECTION I.

NORTH AMERICAN UNIONIDÆ,

NEW SPECIES.

SUBSECTIONS { UNIO,
MARGARITANA,
ANODONTA.

(NOTE. The first or a single page reference after the name of a species refers to descriptive matter; other page references refer to incidental remarks on the species against which they occur.)

UNIO.	VOL. XII.
amabilis *Lea.* (May 16, 1865.)	17.
Beaverensis *Lea.* (June 2, 1868.)	57.
Bisselianus *Lea.* (May 21, 1867.)	37.
Brazosensis *Lea.* (April 7, 1868.)	69, 73.
Clinchensis *Lea.* (May 21, 1867.)	38.
consanguineus *Lea.* [Soft parts.]	87.
Copei *Lea.* (April 7, 1868.)	67, 66.
corvinus *Lea.* (April 7, 1868.)	70.
corvunculus *Lea.* (April 7, 1868.)	74.
Cromwellii *Lea.* (May 16, 1865.)	18.
cylindrellus *Lea.* (April 7, 1868.)	68.
datus *Lea.* (June 2, 1868.)	59.
difficilis *Lea.* (April 7, 1868.)	71.
doliaris *Lea.* (May 16, 1865.)	20.
dorsatus *Lea.* (June 2, 1868.)	60.
fassinans *Lea.* (April 7, 1868.)	65.
genuinus *Lea.* (June 2, 1868.)	64.
granulatus *Lea.* [Soft parts.]	87.
humerosus *Lea.* (June 2, 1868.)	61, 58.
Jewettii *Lea.* (May 21, 1867.)	36.
Lewisii *Lea.* [Soft parts.]	87.
Lincecumii *Lea.* (April 7, 1868.)	72, 70.
Lyonii *Lea.* (May 16, 1865.)	19.
marginis *Lea.* (May 16, 1865.)	15.
Murrayensis *Lea.* (April 7, 1868.)	62.
nubilus *Lea.* (June 2, 1868.)	58.
Pawensis *Lea.* (June 2, 1868.)	62.
planior *Lea.* (April 7, 1868.)	76.
proprius *Lea.* (May 16, 1865.)	16.
protensus *Lea.* (May 16, 1865.)	16.
punctatus *Lea.* (May 16, 1865.)	21.
refulgens *Lea.* (April 7, 1868.)	77, 80.
sparus *Lea.* (April 7, 1868.)	66.
sphæricus *Lea.* (April 7, 1868.)	79.
Topekaensis *Lea.* (April 7, 1868.)	73.

UNIO.	Vol. XII.
Uharëensis *Lea.* (April 7, 1868.)..................	63.
vallatus *Lea.* (April 7, 1868.)......................	75.
MARGARITANA.	
Holstonia *Lea.* [Soft parts and embryo.]...........	87.
ANODONTA.	
Youkanensis *Lea.* (May 21, 1867.).................	47.

SECTION II.

UNIONIDÆ OF MEXICO AND CENTRAL AMERICA,

NEW SPECIES.

SUBSECTIONS {UNIO,
ANODONTA.

UNIO.	VOL. XII.
encarpus *Lea.* (March 10, 1868.)	C. A. 54, 56.
Gabbianus *Lea.* (March 10, 1868.)	C. A. 55.
Granadensis *Lea.* (March 10, 1868.)	C. A. 53.
Nicaraguensis *Lea.* (March 10, 1868.)	C. A. 56, 53.
pliciferus *Lea.* [Soft parts.]	Mex. 86.
rugosulcatus *Lea.* (March 20, 1866.)	C. A. 26.
Strebelii *Lea.* (May 15, 1866.)	Mex. 78.
umbrosus *Lea.* [Soft parts.]	Mex. 86, 87.
Veracruzensis *Lea.* (May 12, 1868.)	Mex. 80, 83.
ANODONTA.	
Bridgesii *Lea.* (March 10, 1868.)	C. A. 51, 50.
Granadensis *Lea.* (March 10, 1868.)	C. A. 48.
inæquivalva *Lea.* (March 10, 1868.)	C. A. 52, 49, 51.
Jewettii *Lea.* (March 10, 1868.)	C. A. 49.
lenticularis *Lea.* (March 10, 1868.)	C. A. 50, 49.
Strebelii *Lea.* (May 12, 1868.)	Mex. 82. Soft parts, 83.

SECTION III.

EXOTIC UNIONIDÆ. (ASIA AND SOUTH AMERICA.)

SUBSECTIONS { UNIO,
ANODONTA,
MONOCONDYLŒA,
MYCETOPUS.

UNIO.	VOL. XII.
acutirostris *Lea.* (March 20, 1866.)	S. A. 30, soft parts 30, oya 31.
ampullaceus *Lea.* (March 20, 1866.)	S. A. 29, 25.
apprimus *Lea.* (Mar. 20, 1866.)	S. A. 23.
asperulus *Lea.* (May 15, 1866.)	As. 40, 42.
Chinensis *Lea.* (May 12, 1868.)	As. 85.
Emesaensis *Lea.* (Dec. 20, 1864.)	As. 14.
evitatus *Lea.* (May 15, 1866.)	As. 39.
firmus *Lea.* (March 20, 1866.)	S. A. 27, soft parts and embryo, 28.
Homsensis *Lea.* (Dec. 20, 1864.)	As. 9.
Kullethensis *Lea.* (Dec. 20, 1864.)	As. 11, 12.
locellus *Lea.* (March 20, 1866.)	S. A. 24.
Mardinensis *Lea.* (March 20, 1864.)	As. 12, 11.
Orphaensis *Lea.* (Dec. 20, 1864.)	As. 10.
Ortonii *Lea.* (June 2, 1868.)	S. A. 81.
Paraguayensis *Lea.* (March 20, 1866.)	S. A. 31, 29.
parcus *Lea.* (March 20, 1866.)	S. A. 22, soft parts, 23.
peculiaris *Lea.* (March 20, 1866.)	S. A. 25, soft parts and embryo, 26.
pilatus *Lea.* (May 15, 1866.)	As. 41, 39.
prunoides *Lea.* (May 12, 1868.)	S. A. ? 83.
rufo-fusculus *Lea.* (April 18, 1865.)	S. A. ? 42.
Siamensis *Lea.* (May 15, 1866.)	As. 39.
tortuosus *Lea.* (April 18, 1865.)	As. 46, 44.
Wrightii *Lea.* (April 18, 1865.)	As. 43.
ANODONTA.	
Napoensis *Lea.* (June 2, 1868.)	S. A. 84.
Pazii *Lea.* (March 20, 1866.)	S. A. 34, soft parts, 35.
MONOCONDYLŒA.	
lentiformis *Lea.* (March 20, 1866.)	S. A. 32.
Mardinensis *Lea.* (Dec. 20, 1864.)	As. 12.
Pazii *Lea.* (March 20, 1866.)	S. A. 33, soft parts, 33.
MYCETOPUS.	
pygmæus *Spix.* [Soft parts.]	S. A. 35.

SECTION IV.

MISCELLANEOUS UNIONIDÆ, ETC.

GENERA AND SPECIES.

SUBSECTIONS
ANODONTA,
ARCA,
CASTALIA,
DIPSAS,
IRIDINA,
MONOCONDYLŒA,

SUBSECTIONS
MYCETOPUS,
PRISODON,
SPATHA,
TRIQUETRA,
UNIO.

ANODONTA.	VOL. XII.
doliaris *Lea*	50.
Forbesiana *Lea*	35.
luteola *Lea*	53.
ovata *Lea*	48.
pygmæa *Spix.* (**Mycetopus.**)	35, 36.
rubicunda *Lea*	35.
Schröteriana *Lea*	85.
siliquosa *Lea*	36.
tenebricosa *Lea*	85.
tenuis *Gray.* (Notes and corrections.)	44.
trapezialis *Lam.*	50, 52.
undulata *Say*	83. Soft parts and embryos compared.
ARCA.	
tortuosa *Lin.*	47, 48.
CASTALIA *Lam.*	47.
DIPSAS *Leach*	44.
discoidea *Lea.* (Notes.)	44.
IRIDINA *Lam.*	82.
MONOCONDYLŒA *D'Orb.*	13, 34.
Francescana *Mori.*	33, 34. [II. 143.]
Paraguayana *D'Orb.*	34. [VI. 39.]
Parchappii *D'Orb.*	34.
Saulcyi *Bourg.* (Unio.)	13.
Wheatleyi *Lea*	13.
MYCETOPUS *D'Orb.*	35, 36, 52.
pygmæus *Spix.* (**Anodonta**.)	35.
PRISODON *Schum.*	46, 47.

SPATHA.	Vol. XII.
Natalensis *Lea*	53.
TRIQUETRA.	
contorta *Lea*	47.
lanceolata *Lea.* (Notes.)	48.
tortuosa *Lea.* (Notes.)	48.
UNIO.	
aquilus *Lea*	17.
atro costatus *Lea*	73.
Bairdianus *Lea*	74.
Bengalensis *Lea*	25, 26.
Blandingianus *Lea*	29.
buxeus *Lea*	16.
Caldwellii *Lea*	57.
caliginosus *Lea*	28.
Charlottensis *Lea*	24, 61.
Charruanus *D'Orb*	29.
cœruleus *Lea*	39, 41, 42.
complanatus *Solander*	9,* 10, 24.
"*complanatus* group."	58, 79.
contradens *Lea*	41.
corrugata *Lam*	84.
Cumingii *Lea*	45, 46.
cuneolus *Lea*	38.
cyrenoides *Phili*	55, 56.
"**Douglasiæ.**" (Notes and corrections.)	43, 44.
Dunkerii *Lea*	45.
Elliottii *Lea*	73.
ellipsis *Lea*	47.
ellipticus *Lea*	43.
ellipticum *Spix*	23.
Estabrookianus *Lea* †	27, 77.
fabalis *Lea*	54.
fallax *Lea*	65.
favosus *Lea*	18.
Ferussacianus *Lea.* (Note.) ‡	15.
germanus *Lea*	54.
glans *Lea*	19, 75.
Holstonensis *Lea*	20.
inornatus *Lea*	23.
intercedens *Lea*	65.
interruptus *Lea*	22.
Lampreyanus *Baird and Adams*	86.
lepidior *Lea* §	32.
Lesueurianus *Lea*	20.
Lindsleyi *Lea*	22.
litoralis *Lam*	14.
Mecklenburgensis *Lea*	59.
Medellinus *Lea*	81.
merus *Lea*	16.
Mexicanus *Phili*	29.
multiradiatus *Lea*	21.
mundus *Lea*	63.

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* On page 9, *fluviatilis* was written in error for *complanatus*. † See Errata. ‡ Change of name. § In error *lepidus*, page 32.

UNIO.	Vol. XII.
Murchisonianus *Lea.* (Notes.)	43, 44, 45.
Myersianus *Lea*	82.
nasutus *Say*	74.
negatus *Lea*	77.
Newcombianus *Lea* *	27, 55, 57.
nitens *Lea*	16.
obesus *Lea*	37, 38, 62.
ornatus *Lea*	23.
Osbeckii *Phili* †	45.
ovatus *Say*	60.
parallelopipedon *Lea*	31.
parvus *Barnes*	15, 19, 69. 71, 75, 87.
paulus *Lea*	19, 71, 75.
Pazii *Lea*	45.
Peguensis *Anthony*	40.
perovalis *Con*	21.
perplicatus *Con*	73.
perradiatus *Lea*	21.
piceus *Lea*	32.
plicatus *Lesueur*	70, 73.
Poeyanus *Lea*	40.
pudicus *Lea*	20.
pustulosus *Lea*	76, 80.
Pybasii *Lea*	68.
pyriformis *Lea*	18.
radians *Lea*	72.
radiatus *Lam*	59.
regularis *Lea*	32.
Rowellii *Lea*	54.
Rutersvillensis *Lea*	74.
salebrosus *Lea*	64.
scitulus *Lea*	67.
semirugatus *Lea*	14, 15.
Shanghaiensis *Lea.* (Notes.)	44, 45.
Shurtleffianus *Lea*	41.
Saulcyi *Bourg*	13.
Spillmanii *Lea*	21.
squalidus *Lea*	18.
striatulus *Lea*	18.
subangulatus *Lea*	67, 81.
subellipsis *Lea*	59.
subtortus *Baird and Adams.* (Notes.)	44.
Tientsinensis *Crosse and Debeaux.* (Notes.)	44, 47.
tumidus *Retz*	45.
turgidus *Lea*	76.
Uruguayensis *Lea*	24.
verrucosus *Bar*	77, 78.
Weldonensis *Lea*	24, 59, 61.
Whiteianus *Lea*	11.
Wymanii *Lea*	26.

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* See Errata.

† = Shanghaiensis *Lea*.

SECTION V.

OPERCULATED AQUATIC UNIVALVES.

(PARTS A. AND B.)

SUBSECTIONS { ANCULOSA, GONIOBASIS, LITHASIA,

SUBSECTIONS { PALUDINA, SCHIZOSTOMA, TRYPANOSTOMA.

PART A.—NEW SPECIES.

ANCULOSA.	VOL. XII.
Downiei *Lea.* (May 12, 1868.)	102.
GONIOBASIS.	
arata *Lea.* (May 12, 1868.)	89.
bifasciata *Lea.* (May 12, 1868.)	91.
clavula *Lea.* (May 12, 1868.)	95.
clathrata *Lea.* (May 12, 1868.)	91.
cochliaris *Lea.* (May 12, 1868.)	96.
Connesaugaensis *Lea.* (May 12, 1868.)	93.
contigua *Lea.* (May 12, 1868.)	94.
Gesnerii *Lea.* (May 12, 1868.)	90.
Gouldiana *Lea.* (May 12, 1868.)*	92.
granatoides *Lea.* (May 12, 1868.)	95, 89.
luteocella *Lea.* (May 12, 1868.)	92.
Murrayensis *Lea.* (May 12, 1868.)	94.
ornata *Lea.* (May 12, 1868.)	97, 90.
similis *Lea.* (May 12, 1868.)	88, 89.
sulcata *Lea.* (May 12, 1868.)	89.
venusta *Lea.* (May 12, 1868.)	96.
Wheatleyi *Lea.* (May 12, 1868.)	88.
Whitfieldensis *Lea.* (May 12, 1868.)†	90, 93.
LITHASIA.	
curta *Lea.* (May 12, 1868.)	100.
cylindrica *Lea.* (May 15, 1866.)	101.
purpurea *Lea.* (May 12, 1868.)	100.
Wheatleyi *Lea.* (May 15, 1866.)	101.
PALUDINA.	
Spillmanii *Lea.* (May 21, 1867.)	103.

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* Changed from *pulchella*, preoccupied.

† Changed from *tenebrosa*.

SCHIZOSTOMA.	Vol. XII.
Wheatleyi *Lea.* (May 12, 1868.)	102.
TRYPANOSTOMA.	
castaneum *Lea.* (May 12, 1868.)	98.
nuciforme *Lea.* (May 12, 1868.)	97.
terebrale *Lea.* (May 12, 1868.)	99.
Wheatleyi *Lea.* (May 12, 1868.)	98.

Part B.—MISCELLANEOUS SPECIES.

ANCULOSA.	Vol. XII.
gibbosa *Lea*	103.
picta *Con.*	103.
GONIOBASIS.	
auriculæformis *Lea*	93.
Bridgesiana *Lea*	88, 94, 95.
Christyi *Lea*	94.
Clarkii *Lea*	96.
flavescens *Lea*	91, 93.
formosa *Con.*	91.
Gerhardtii *Lea*	90, 97.
glauca *Anth.*	92.
granata *Lea*	95.
harpa *Lea*	89.
mutabilis *Lea*	97.
pulchella *Lea* *	92.
robusta *Lea*	97.
rubella *Lea*	96.
tenebrosa *Lea* †	90, 93.
Tryoniana *Lea*	95.
LITHASIA.	
Downiei *Lea*	101.
semigranulosa *Desh.* ‡	100.
Showalterii *Lea*	100.
PALUDINA.	
subcarinata *Say*	103.

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* Preoccupied; changed to *Gouldiana* Lea.

† Preoccupied; changed to *Whitfieldensis* Lea.

‡ See errata.

SCHIZOSTOMA.	Vol. XII.
excisa *Lea*	102.
TRYPANOSTOMA.	
Brumbyi *Lea*	99.
Christyi *Lea*	98.
elongatum *Lea*	99.
mucronatum *Lea*	99.
Tennesseense *Lea*	98.
Whitei *Lea*	98.

SECTION VI.

SUBJECT MATTER FROM VOLS. I. TO XII., ALPHABETICALLY ARRANGED.

Absence of Melanopsis in the U. S. IV. 24.
Accessory column in Helices. V. 60.
Acknowledgment of specimens. I. 131. Introd. Vol. XII.
Acknowledgments to correspondents. I. 197, V. 9, VI. Introd. and 46, 55, XI. Introd.
Acknowledgments to the Smithsonian Institution IX. 9.
Affinities of *U. occidens and U. ventricosus.* II. 126.
African Unionidæ; remarks on. XI. 35.
Agassiz; genera. X. 89.
  “ on *An. Ferussaciana.* X. 89.
  “ on COMPLANARIA: correction. X. 82.
  “ on gills of *U. nasutus;* correction. X. 40.
  “ on ovisacks. VI. 43.
  “ on STROPHITUS; correction. X. 86.
Alabama and Altamaha Rivers. I. 138.
Alasmodonta truncata Say—unpublished. II. 135.
AMNICOLA—not recognized by Chenu. IX. 91.

ANATOMY AND EMBRYOLOGY OF UNIONIDÆ, ILLUSTRATED (REFERRING TO SPECIES).

ANATOMY [ANODONTA, MARGARITANA, UNIO].

An. fluviatilis Solander. II. 51.
“ *undulata* Say. II. 51, 52, 54.
M. margaritifera Lin. VII. 42.
U. cariosus Say. II. 49, 51, 53.
“ *irroratus* Lea. I. 12.
“ *multiplicatus* Lea. VII. 40.
“ *ochraceus* Say. II. 49, 51, 54, 57.
“ *parvus* Bar. VII. 39.
“ *phaseolus* Hild. VII. 38.
“ *Prattii* Lea. VII. 24.
“ *radiatus* Lam. II. 52.
“ *stramineus* Con. VII. 41.
“ *ventricosus* Bar. VII. 42.

EMBRYOS [ANODONTA, MARGARITANA, UNIO].

An. decora Lea. VI. 49.
“ *edentula* Say. VI. 50.
“ *Ferussaciana* Lea. VI. 50.
“ *imbecillis* Say. VI. 50.
“ *Lewisii* Lea. VI. 49.
“ *ovata* Lea. VI. 49.
“ *undulata* Say. VI. 46, 50.
M. complanata Bar. VI. 49.
“ *deltoidea* Lea. VI. 49.
“ *Hildrethiana* Lea. VI. 49.
“ *marginata* Lea. VI. 49.
“ *triangularis* Lea. VI. 49.
U. alatus Say. VI. 45, 48.
“ *anodontoides* Lea. VI. 46.
“ *lævissimus* Lea. VI. 44, 48.
“ *ligamentinus* Lam. VI. 47.
“ *luteolus* Lam. VI. 47.
“ *multiplicatus* Lea. VI. 47.
“ *multiradiatus* Lea. VI. 47.
“ *Novi-Eboraci* Lea. VI. 47.
“ *occidens* Lea. VI. 47.
“ *ovatus* Say. VI. 47.
“ *penicillatus* Lea. VI. 47.
“ *perplexus* Lea. VI. 48.
“ *phaseolus* Hild. VI. 47.
“ *Prattii* Lea. VI. 47.
“ *pressus* Lea. VI. 48.
“ *radiatus* Lam. VI. 48.
“ *rectus* Lam. VI. 47.
“ *retusus* Lam. VI. 47.
“ *rutilans* Lea. VI. 46.
“ *securis* Lea. VI. 47.
“ *spatulatus* Lea. VI. 47.
“ *subangulatus* Lea. (*ova*) VI. 50.
“ *triangularis* Bar. VI. 48.
“ *undulatus* Bar. VI. 48.
“ *Woodwardianus* Lea. 45, 47.
Anatomical examinations of Uniones. I. 5.
ANCULOSA; soft parts of. IV. 14.
Anculosa isogona Say. Notes on. IV. 16.
Anculosæ of the Coosa River; opercula of. IX. 43.
Anculosa; operculum of. IV. 14.
Animalculæ; food of Uniones. I. 3.
Anomalous character of *U. monodontus.* I. 98.
Anomalous form of *U. stapes.* I. 88.
Anterior and posterior gaping of *An. Moricandii.* X. 53.
Anterior and posterior of Uniones, reversed. I. 3.
Anthony on GYROTOMA. IX. 67.
Anthony on SCHIZOSTOMA. IX. 67.
Appalachicola River. I. 138.
Armature of *Planorbis Wheatleyi.* XI. 114.
Augur shaped lip or aperture of Melania [Trypanostoma]. IV. 63, IX. 90, 114.
Barnes' Example as a Conchologist. I. 1.
Barnes on Lamarck. I. 35.

Barnes' varieties of *U. crassus.* II. 127.
Beaks; concentric undulations of. I. 27, 75.
Beaks, distinguish *U. plicatus* from *U. undulatus.* I. 78.
Beaks; false, I. 75.
Beaks; folds of. I. 27, 75.
Beaks of South American Unionidæ with radiated folds. I. 173.
Beaks; position of, relative to teeth. I. 22.
Binney; omission in Bibliography. Introd. Vol. X.
Binney on Helices. V. 60.
Binney on Succinea. XI. 136, 137.
Blainville on anterior and posterior of Uniones. I. 3.
Branchiæ; 4 leaves, filled with ova. X. 53, 64.
Branchiæ of Unionidæ. II. 51.
Branchiæ of *U. multiplicatus*, anomalous. VII. 9.
Branchia of *U. rutilans*, variable. VI. 60.
Branchial canal, sensitive to light (*Haldeman*). VI. 51.
Branchial uterus. VI. 43, 45, 46, 56.
Branchial uterus and ovisacks of *U. irroratus*, peculiar. I. 12, X. 70.
Branchial uterus; color of. VI. 44.
Branchial uterus, folded. X. 80.
  See *U. phaseolus.* VII. 38.
    U. Woodwardianus. VII. 17.
Branchial uterus; sacks from. VI. 45, 46.
Buccinum striatum Chemn. I. 197.
Burrowing habits of *Marg. dehiscens* Say (*oriens* Lea). I. 117, XII. 36.
Burrowing habits of *Mycetopus.* XII. 36.
Byssus of Unionidæ at mature age. VI. 51.
Byssus of Embryonic Unionidæ. VI. 45.
Byssus of Unio and Anodonta (*Kirtland*). III. 68, X. 47.
Byssus of Unionidæ. Introd. Vol. VI.
Byssus of *U. acutissimus.* VI. 71, X. 46, 47, XI. 50.
  " *U. Conradicus.* VI. 71, X. 46, 47, XI. 50.
  " *U. parvulus.* XI. 50.
  " *U. rubellinus.* VI. 71, XI. 50.
Cabinet—Ferussac's, of Rafinesque's species. II. 120.
  " Jardin des Plantes; specimens in. I. 146.
  " Lamarck's; notes on. I. 198.
  " Mr. Hyde's; notes on specimens in. I. 129.
  " Naiades. Introduction. Vol. I.
Carocolla and Helix; remarks on. IV. 1.
Castanea pumila ("Chincapin") compared to *Trypanostoma nuciforme.* XII. 98.
Catalogue—Ferussac's, of Rafinesque's species. II. 120.
Catalogue of Melania. IV. 70.
Characteristics of South American Uniones, in shells and soft parts. Introd. Vol. XII.
Change of name of *U. Raveneli* Con. II. 130.
  " " *Triquetra contorta.* VI. 41.
  " " *Triquetra lanceolata.* XII. 48.
Cicatrices. I. 4.
Cicatrices—dorsal, of Uniones. I. 40.
Cicatrices of *An. Blainvilliana.* I. 190.
Cicatrices of mantle. I. 28.
Cicatrices of *Spatha soleniformis.* II. 142.
Cicatrices of *U. Africanus*, of unusual character. VI. 19.
Cicatrices of *U. Brownianus* and other South American species; unusual. I. 77, 153, II. 109.
Cicatrix, third anterior. III. 31, IV. 35.
Cicatrix of *Triquetra contorta*, unusual. VI. 40.
Cicatrix, ventral, of *U. trapezoides.* I. 80.
Cicatrix, ventral. I. 80, VI. 61, VIII. 65.
Circulation in Syphons of Uniones. I. 76.
Circumference or margins of Uniones. I. 28.
Clark, J.—on *An. edentula.* V. 45.
Color of nacre of Uniones. I. 23, 87, 116.
Color of Unions, accidental. I. 17.
Concentric undulations of beaks. I. 27.
Conchology—objections to, answered. I. 17.
Confusion of names for *U. siliquoideus* Bar.[*] II. 127.
Connate character of *U. alatus.* I. 62.
Connate Unionidæ. I. 56, 57, 78. [See Symphynote].
Connecting link between *U. ovatus* and *U. ventricosus.* I. 50.
Conrad on *U. crassus.* II. 127.
Contemplated system of Naiades. II. 116.
Contribution of specimens for description, acknowledged, Introd. Vol. XII.
Coosa River (Ala.); geographical centre of a group of Melania. IX. 39.
Correction of error; etymology of Unio. I. 103. [Foot note.]
Correction of Deshayes. II. 116. [Foot note.]
Correction—*U. incurvus.* I. 202.
Corrections of Agassiz. [See Agassiz.]
Corrugated beaks of *U. negatus.* VIII. 81.
Corrugated beaks of Unionidæ of Western Asia. XII. 11.
Crenulated cardinal teeth of Castalia. I. 117.
Cut lipped Melania (Schizostoma), not found in Ohio. IX. 67.
Cuvier—Classification of Unionidæ. I. 2.
Cuvier on Melania. IX. 40.
DAMALIS *Leach* and priority of MARGARITANA *Schum.* II. 134. [Note.]
Dentate shells of female Uniones. I. 147, II. 50.
Deshayes on Lamarck's fossil Melania. IV. 24.
Deshayes on Naiades. II. 115.
Difficult specific characters of Unionidæ. I. 21.
Difficult specific characters of Uniones of Lake Nicaragua. XII. 49.
Difficulty of subdividing Naiades. II. 114.
Dissection of *U. irroratus.* I. 13.
Dissections of Uniones. I. 5.
Dissent to the opinions of Gould and Binney on Helices. V. 60.
Distribution (geographical) of Unionidæ. I. 136.
Distribution (geographical) of *Marg. margaritifera.* VII. 43.
Distribution of the genus Lymnæa. IV. 8.
Divergent folds of beaks of South American Uniones. Introd. Vol. XII. and pages 24, 34.
D'Orbigny's figures and descriptions of soft parts of South American Uniones. Introd. Vol. XII.

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[*] U. luteolus *Lam.*

D'Orbigny on *An. Blainvilliana* II. 139, 140.
D'Orbigny on soft parts of Monocondylœa. XII. 34.
Doubtful admissibility of *U. mytiloides* Raf. II. 125.
Duty of the Zoologist. I. 9.
Eggs of *U. cylindricus* Say (Dr. Kirtland). III. 65.
Eggs—Red, of Uniones. X. 52, 53, 64, 65, 68.
Eggs—Red, not observed in South American Uniones. Introd. Vol. XII.
Elevated line on *U. Nicklinianus*. III. 72.
Elevations on the surface of the disks of Uniones. I. 24.
Embryos of *An. undulata*. VI. 50, X. 86.
Embryos, illustrated. [See Anatomy and Embryology illustrated.]
Embryos, subtriangular. VI. 46.
Embryos of species. VI. 46 to 50.
Embryos, size of. VI. 46.
Embryos, wedge shaped. X. 61, 70.
Embryonic differences of species; not observed by Poli, Carus, and Pfeiffer. VI. 43.
Embryonic forms. Introd. Vol. VI.
Embryonic forms, natural groups of. VI. 44.
Embryonic forms, not analogous to adult forms. VI. 44.
Embryonic germs in Anodonta; numbers of. I. 4.
Embryonic Unionidæ. VI. 43 to 50. [See Anatomy and Embryology.]
" " Byssus of. VI. 45.
" " dimensions of granules on. VI. 44.
" " dimensions of hook of. VI. 45.
" " double line on margin. VI. 45.
" " epidermal colors of. VI. 44.
" " granular surface of. VI. 44.
" " hook or spur of. VI. 44, 45.
" " muscles of. VI. 45.
" " pouch shaped. VI. 46.
" " under the microscope. VI. 44.
" " wedge shaped. VI. 45.
Embryonic young and soft parts of known species of Uniones. X. 38 to 92.
Epidermal colors of Uniones. I. 74.
Epidermal deposit on interior of shells. XII. 33.
Epidermal markings; Uniones without. I. 25, 26.
Epidermal matter in nacre of Uniones. I. 74, 75.
Epidermal rays of Anodontæ, crimpled. VI. 37.
Epidermis of *Helix spinosa*, crimpled. II. 69.
Epidermis of Plagiodon like that of Estuary Shells. VI. 38.
Epidermis of *U. circulus*, satinlike. I. 48.
Epidermis of Unionidæ, functions of. I. 18.
Epidermis, wrinkled. VI. 33.
Erosion of Uniones. I. 27, 75.
Error of habitat of *An. Bridgesiana*. XII. 52.
Error of locality of *U. obesus*. I. 118.
Error of locality of *U. rugososulcatus*. XII. 27.
Eurynea *Agass*. Remarks on. X. 92.
False beaks. I. 75.
False species from *U. complanatus*. I. 24.
Family Naiades, supposed to be one genus. I. 20.
Female of *U. dolabræformis*. II. 104.
Female Uniones, how distinguished. II. 50, 51.
Ferussac's proposed subdivision of Naiades. II. 117.
Festoon like striæ of *U. encarpus*. XII. 55, 56.
First Neritina found in the fresh water of the United States. IX. 89.
Florida, unexplored for Unionidæ. Introd. Vol. VIII.
Florida, Unionidæ of. IV. 31.
Folded beaks of *U. asperulus*. XII. 41.
Folded beaks [see Beaks]. I. 27, 75.
Folds, peculiar, of *U. Neislerii*. VIII. 31.
Food of Unionidæ. I. 3, 75.
Food of Unionidæ, experiments on. I. 3, 75.
Forbes' expedition to South America. X. 13.
Forms of shells in various families. I. 19.
Genera (new). [References to description in **heavy type**.]
  Aphrodite (February 7, 1834.) **I. 223**.
  Basistoma (March 5, 1852.) **V. 51**.
  Columba (March 15, 1833.) I. 190 *, II. 139.
  Eurycælon (January 12, 1864.) **XI. 106**.
  Goniobasis (May 27, 1862.) **X. 39**, 40, 118.
  Io (January 7, 1831.) **I. 132**, IV. 17, IX. 40, 84, 91, 167, 168.
  Macrolimen (June 3, 1862.) IX. 43 (defined.)
  Megasystropha (January 12, 1864.) **XI. 110**.
  Meseschiza (January 12, 1864.) **XI. 108**.
  Pachychilus [mentioned.] **XI. 77**.
  Plagiodon (April 1, 1856.) **VI. 37**.
  Pompholyx (April 1, 1856.) **XI. 112**.
  Schizocheilus (March 5, 1852.) **V. 51**, IX. 67.
  Schizostoma (December 16, 1842.) **IV**. 26, **67**, IX. 40, 67, 68.
  Spatha. II. 114, 118, XI. 40, 41.
  Strephobasis (April 16, 1861.) **IX**. 40, **86**, 177.
  Symphynota (March 6, 1829.) **I. 56**, II. 115.
  Trypanostoma (April 15, 1862.) **IX. 90**, 91, 172, XI. 108.
Genera, confusion of European writers on, IX. 91.
Genera, new; reasons for establishing. IX. 90.
Genera of Melania, characterized. IX. 40.
Genera—system of grouping. II. 118.
Generic difficulties of "*U. oriens*." I. 80.
Generic limits, impossibility of defining. I. 77.
Genus Iridina. Remarks on. II. 141.
" Lithasia, not adopted by Gray, Reeve or Adams. IX. 91, 168.
" Lithasia. IX. 39.
" Margaritana; priority over Alasmodonta. (Notes.) I. 43, II. 134.
" Melatoma *Swainson*, founded on an Ohio shell. IX. 67.
" Melatoma *Swainson;* Gray on. IX. 67.
" Monocondylœa *D'Orb*. II. 135.
" Platiris *Lea*. II. 141.
" Pleiodon *Con*. II. 141.
" Schizostoma. IV. 67.
" " subgroups of. IX. 68.
" Trypanostoma; type of. IX. 90.
" Unio, in the waters of the United States. I. 20.
" " perplexing changes in. I, 2.
" " resemblances in. II. 58.

---

* Proposed.

Geographical distribution. I. 136.
" " of *Marg. complanata.* IX. 37.
" " of *U. Scamnatus.* VII. 77.
" " of *U. luteolus.* IX. 37, X. 38.
" " Tables of. II. 145 to 151.
Geology, remarks on. Introd. Vol. I.
Georgia, zoological centre of Unionidæ. Introd. Vol. VI.
Gestation of Unionidæ. III. 68. [See Incubation.]
Group, modern (geological). Introd. Vol. I.
Grammatical sex of the word Unio—John Carey on. I. 6.
Habits and food of Uniones. I. 3, 75.
Habits of *An. Chaiziana.* II. 138.
Habits of *An. Wardiana.* II. 47.
Habits of *Iridina rubens.* II. 138.
Habits of *U. compressissimus.* IV. 55.
Habits of *Marg. dehiscens.** I. 117, X. 77, XII. 36.
Habits of *U. monodontus.*† I. 116.
Habits of Schizostoma. (Dr. Showalter on.) IX. 68.
Hair-like rays of *U. securis.* I. 45.
Hallenbeck on soft parts of *U. dispar.* VIII. 10.
Hollow spines of *U. spinosus.* X. 44.
Hump of *U. dromas.* I. 182.
Identity of *An. cygnea* and *An. anatina.* II. 137.
Identity of *Mya nodulosa* Wood. XII. 47.
Impregnation of Unionidæ. III. 68.
Incubation of Unionidæ. VI. 43. [See Gestation.]
Inequivalve characters of certain Chinese Uniones not noticed by French and English writers. XII. 44.
Inequivalve character of *U. tortuosus.* XII. 47.
Inequivalve shells. Notes on. XII. 48, 49, 53, 54, 55, 56, 57.
Inequivalve Unionidæ of Central America. Introd. Vol. XII. and page 57.
Inequivalve Uniones. List of species. XII. 49.
Io nodosa—the type of a group of species. IX. 186.
Io—Reeve on. IX. 168.
Io—Restoration of Mr. Say's species *fluvialis.* IX. 167.
Io—separated from Fusus. I. 133.
Knob-like papillæ of Monocondylœa. XII. 34.
Lamarck—Classification of Unionidæ. I. 2.
" Hermaphrodism of Uniones I. 4.
Lamarck's species criticized; object of. I. 39.
Lamarck—Swainson's criticism of. I. 1.
Lamarck's Unionidæ—difficult to identify. I. 35.
Lamarck's Unionidæ—habits of some species. I. 36 to 39.
Lamarck's Unionidæ—observations on. I. 198.
Lamarck on Viviparous Unionidæ. I. 4.
Letter of Prof. Ravenel. I. 125.
Ligament (hinge of Uniones). I. 29.
Light, Uniones sensitive to. Introd. Vol. VI. VI. 51, X. 64.
Lindley on species. II. 114.
Linnæus classifies Unionidæ with *Mya* and *Mytilus.* I. 136.
List of authors. II. 152.
List of Rafinesque's unrecognized species. II. 104.
List of species of Inequivalve Uniones. XII. 49.
Lithasia purpurea allied to Anculosa. XII. 100.
Lowest fossiliferous group (geological). Introd. Vol. I.
Male and female Uniones (Dr. Kirtland). II. 49.
MARGARITANA *Schum.* priority of. I. 43, II. 134.
Margins or circumferences of shells of Uniones. I. 28.
Massive plate of *U. planulatus.* I. 46.
Measurements of Uniones—method of. I. 6.
Melania, Cuvier on. IX. 40.
Melania—grouped by external characters. III. 1.
" no recent species in Europe. III. 1.
" number of species. III. 1, IV. 24, 70.
" with pleurotomose or cut lip. IV. 26.
Melanidæ. Genera characterized. IX. 40.
Melanopsis not found in the United States. IV. 24.
" number of species. I. 195.
Melatoma costata Swainson. (Type of a genus) from the Philippine Isles. IX. 68.
Melatoma not found in the United States. IX. 67.
Metallic sound of valves of Uniones. I, 59.
Microscopic Investigations of Embryonic Unionidæ. VI. 44.
McLeay's circular system of classification. II. 106.
Modern group (geological). Introd. Vol. I.
Mode of formation of tubercles and folds in Uniones. I. 73.
Muscular attachments. I. 18, 19.
Muscular cicatrices. I. 4, 40, 77, 80, 153, 190. II. 109, 142, III. 31, IV. 35, VI. 19, 40, 61, VIII. 65.
Muscular impressions. I. 28.
Muscles of Uniones, functions of. I. 4.
Nacre—copper colored. I. 104.
Nacre of Uniones—color of. I. 87, 116.
Nacre of Uniones, epidermal matter in. I. 74, 75.
Naiades, Blainvilles' subdivisions of. II. 115.
" contemplated system of. II. 116.
" Deshayes' remarks on. II. 115.
" difficulty of subdividing. II. 114.
" natural subdivisions, by external characters. II. 119.
" Nicklin's opinions on. II. 117.
" of little interest to early writers. I. 135, 136.
" supposed by some authors to be but one species. I. 20.
" Sowerby's remarks on. II. 115.
" Systematic grouping of genera. II. 118.
Necessity of observing specimens of different ages. I. 75.
Neritina, first species found in fresh water in the United States. IX. 89.
New species (Unionidæ) to be hereafter described. Introd. Vol. XII.
Nicaragua Lake, Inequivalve shells of. Introd. Vol. XII. and page 57.
Nidus of parasites in soft parts of Unio. VI. 63.
Nomenclature of Uniones. I. 29.
No Red Ova in South American Uniones. Introd. Vol. XII.
Number of species of American Lymnæa. IV. 8.
Number of species of Helices in the United States. IV. 1.
Number of species of Melania. III. 1, IV. 24.

---

* = oriens *Lea.*

† = soleniformis *Lea.*

Number of species of Paludina. IV. 13.
Number of species of Unionidæ. II. 113, 114. Introd. Vols. VIII. IX. X. XI. XII.
Observations of T. G. Lea on Uniones. III. 68.
Observations on Uniones in confinement. I. 3, 21, 27.
Operculum of *Gon. Showalterii* of unusual form. IX. 43.
Opinions of European writers on sexual difference of Uniones, II. 49.
Ova, in sack. II. 52.
Ova of Unionidæ, tabular notes on, by T. G. Lea. III. 69.
Ova of Valvata. IV. 22.
Ovaries and oviducts, found as described by Cuvier, Bosc, Carus, and others. I. 13.
Oviducts (Branchial uteri) of Anodonta with 600,000 young. I. 4.
Oviducts and ova. II. 48, 51, 53, 54, 55, 56, 57, III. 69, 70, 71, VI. 56.
Oviducts, difference in structure of, in Anodontæ. II. 51.
Oviducts, Dr. Leidy on. VI. 43.
Ovisacks, Agassiz on. VI. 43.
Ovisacks of *An. undulata*, remarkable arrangement of, VI. 50, X. 86.
Ovisacks of *U. irroratus*, arrangement of. I. 13.
Ovisacks of *U. radiatus;* size and number of young. X. 48.
Ovulation. VI. 43.
Palpi—round form of in South American Unionidæ. X. 27, 30.
Parturition of Uniones. III. 68.
Perfection of organization of Unionidæ. I. 2.
Perplexing changes in the Genus Unio. I. 2.
Phrygania (insect) Larva case of. I. 139.
Physa growing in salt water. XI. 122.
Plicate beaks of young of *U. multiplicatus.* I. 81.
Polyphemus glans Say. I. 197.
Ponderous Uniones referred to *U. crassus.* I. 35.
Priority of MARGARITANA *Schum.* [Note.] I. 43. II. 134.
Proper names used in naming species. V. 61.
Pustular Uniones compared. I. 89, 90, II. 11.
Radiations or rays on Uniones. I. 5.
Rafinesque's discrepancies. II. 120.
" names of species in doubt. II. 131.
" species difficult to identify. II. 125.
" works not much quoted. II. 120.
Red Eggs of *Uniones Æsopus*, *rubiginosus*, and *subrotundus.* X. 52, 64, 65, 66.
Red nacre of *An. Pazii.* XII. 35.
Red ova, none observed in South American Uniones. Introd. Vol. XII.
Remarkable cicatrix of muscles of the foot of Uniones. I. 78.
Reversed cardinal teeth of *U. parcus.* XII. 23.
Say's synonymy of *U. cardium* Raf. II. 125.
Schizostoma, two natural groups of species. IX. 68.
Sexes of Uniones (Dr. Kirtland on). II. 49.
Sexual relations of *U. formosus* and *U. triangularis.* II. 124.
Sexual relations of *U. ridibundus* and *U. sulcatus.* II. 126.
Sexual characters of Uniones. II. 49, 50.
Sexual differences of Uniones. III. 68.
Sexual distinctions. European writers on. II. 49.
Shell, bought of dealer. I. 140.
Shells analogous to skeletons of vertebrates. I. 18.
Shells, forms of in various families. I. 19.
Shells in graves of aborigines. I. 224.
Shells of Alabama and Tombecbee Rivers. I. 138.
Shells of California. XI. 110.
Shells of Chattahoochee River. III. 46.
Shells of Columbia River. II. 97.
Shells of Lake Champlain. I. 138.
Shells of Lake Nicaragua, slight specific differences of. XII. 49.
Shells of Lake Nicaragua, sulcated disks of. XII. 52.
Shells of Ohio and Texas. List of identical species. XI. 31.
Shells of River St. Lawrence. I. 137.
Shells of tributaries of the great Lakes, &c. I. 137.
Showalter on *Trypanostoma Hartmanii.* IX. 92.
Sinus of South American Anodontæ. I. 191.
Soft parts and Embryos of known species of Unionidæ, X. 38 to 92, XII. 86.
Soft parts of South American Unionidæ, not noticed by Spix. Introd. Vol. XII.
Soft parts of Mexican Unionidæ. XII. 86.
Soft parts of *U. lamellatus.* II. 19.
Soft parts of Valvata. IV. 21.
Species, difficult in distinguishing. I. 20.
Species of Mollusca obtained by Forbes' expedition to South America. X. 13.
Spines of *U. spinosus.* II. 58, X. 49.
" " " lined with a process of the mantle. X. 49.
Stewart, assistant dissector. I. 5.
Style, in female *U. perplexus* and *U. cariosus.* X, 56.
Subdivided teeth of *U. acutirostris.* XII. 31.
" " *U. apprimus.* XII. 24.
Succinea, Review of Binney, Gould and Binney, XI. 136 to 138.
Sulcate group of Uniones. VI. 22.
Superficial elevations on the disks of Uniones. I. 73, 74.
Supra anal opening free, instance of. VI. 88.
Supra anal opening absent, instances of. XII. 26, 30, 34, 35.
Swainson on Lamarck. I. 35.
Synonymy of *Anculosa inflata.* III. 10.
Symphynote or Connate Uniones. I. 56, 57, 78.
Synopsis of the Family NAIADES. II. 113, *ad finem.*
Tables of geographical distribution. II. 145 to 151.
Teeth, acicular lateral, in Mycetopus. X. 35.
" cardinal, duplication of. VIII. 103.
" " triplication of in *U, peculiaris.* XII. 26.
" double lateral in right valve. VII. 68, VIII. 25.
" imperfect; group of Uniones having. I. 149.
" of *Marg. calceola*, curved. I. 7.
" of Uniones, as specific characteristics. I. 22.
" of Uniones of Asiatic Islands. VII. 58.
" of *U. Cailliaudii*, double in both valves. VI. 18.
" of *U. tortuosus*, like Prisodon. XII. 46.

Teeth, position of, relative to beaks. I. 22.
“ reversed. I. 58, 177, II. 75.
“ single in both valves. VIII. 103.
“ treble lateral of *U. pilatus.* XII. 39, 41.
“ trifid. XI. 42.
“ “ cardinal of *U. Wymanii.* X. 18.
“ “ *U. Leibii.* XI. 48.
“ “ *U. trifidus.* X. 23.
Thermal waters inhabited by *Pal. Nickliniana.* II. 92.
Theobroma cacao, suggests the name of *U. cacao.* VIII. 27.
Timidity of Uniones. I. 76.
Triangular fosset of South American Anodontæ. V. 44, 48.
Triangular sinus of *An. lato-marginata.* X. 30.
“ “ of *U. Uruguayensis.* X. 30.
Tubercular Uniones compared. I. 96.
Twisted shell of *Triquetra contorta.* VI. 46.
Type of the genus TRYPANOSTOMA. IX. 91.
Umbonial slope. I. 24.
Umbo. [See Beaks.]
Undulations of Monocondylœa not mentioned by D'Orbigny. XII. 34.
Unequal lateral margins of *U. peculiaris.* XII. 26.
Unio, habits of. I. 3, 20.
Unio heros, abandoned by Mr. Say. II. 122.
“Unio.” Masculine in Syntax. I. 6.
Unio trigonus, label of, in Academy of Natural Sciences, II. 125.
“Uteri”—not found in the four branchial leaves of South American Uniones. Introd. Vol. XII.
Valvata observed in confinement. IV. 22.
Valves of Uniones, importance of, to other parts. I. 18.
Variable form of mantle in females of *U. radiatus.* II. 52.
Variable tints of nacre of Uniones. I. 115.
Variations in the size of *U. complanatus.* I. 22.
“Var. a” of *U. ellipsis.* I. 45.
Visual organs of Uniones. Introd. Vol. VI. and page 51,
Winged Uniones. I. 56, 57, 78. [See Connate.]
Wyman, Prof. Expedition to South America, X. 13.
Yellow mark of *U. ebenus.* I. 95.
Young shells, 600,000 in an Anodonta. I. 4.

SECTION VII.

PART A. SUPPLEMENTARY TO ERRATA ET CORRIGENDA OF VOLS. I. TO XI. IN INDEX TO THOSE VOLUMES.

Vol.	Page.	
II.	100,	12 lines from top, for *Caleforniensis* read *Californiensis.*
IV.	64,	10 lines from bottom, for aperture read apex [being eroded.]
V.	33,	10 lines from top, for *sparsis* read *sparsus.*
VI.	78,	9 lines from bottom, for *legumentinus* read *ligamentinus.*
VII.	21,	4 lines from top, for *Cumberlandianus* read *Cumberlandicus.*
“	54,	near middle of page, for *Vondenbuschiana* read *Vondembuschiana.*
VIII.	22,	middle of page, for *Cumberlandianus* read *Cumberlandicus.*
“	28,	11 lines from top,
“	26,	7 lines from top, for *Henleyanus* read *Hanleyanus.*
“	30,	3 and 4 lines from top, for *punvinulus* read *pulvinulus.*
“	72,	8 lines from bottom, for heads read beaks.
“	90,	15 lines from bottom, for form read from.
IX.	60,	7 lines from bottom, for *qlobula* read *globosum.* [Schizostoma.]
“	93,	8 lines from top, for *prassinata* read *prasinata.*
IX.	98,	6 lines from top. *Mel. Niagarensis* is a Goniobasis.
IX.	100,	3 and 8 lines from bottom, for *bivittata* read *bivittatum.*
“	106,	7 lines from bottom, for *moriformi* read *moriforme.*
“	111.	7 and 9 lines from bottom, for *moriformi* read *moriforme.*
“	138,	4 lines from bottom, for *Deshaysiana* read *Deshayesiana.*
“	139,	17 “ “ “
“	140,	7 “ “ “
“	141,	19 “ “ “
“	145,	5 “ “ “
“	146,	17 “ “ top,
X.	85,	6 “ “ bottom, for *imbecilis* read *imbecillis.*
XI.	38,	10 lines from top, for *apiculatis* read *apiculatus.*
“	49,	lower corner, for *H. acutissimus* read *U. acutissimus.*
“	52,	12 lines from top for *plicata* read *lævi.*
“	58,	17 lines from bottom, for *M.* (before Vescoi) read *Unio.*
“	60,	13 lines from top, for *M.* read *U.*
“	82,	4 lines from top, for *M. scilicula* read *M. silicula.*

PART B. ERRATA ET CORRIGENDA, VOL. XII.

VOL. PAGE.
XII. 9, 2 lines from bottom, for *fluviatilis* read *complanatus.*
" 13, 7 lines from bottom, for *Soulcyi* read *Saulcyi.*
" 32, 9 " " top, for *lepidus* read *lepidior.*
" 47, 18 " " bottom, for page 285 read page 44.
" 54, 17 " " top, for Charges River read Chagres River.
" 55, 10 " " top, for *Newcombii* read *Newcombianus.*
" 73, 14 " " top, for *purplicatus* read *perplicatus.*
" 74, 10 and 20 lines from top, for *Ruttersvillensis* read *Rutersvillensis.*

VOL. PAGE.
XII. 77, 3 lines from top, for *Estabrookii* read *Estabrookianus.*
" 85, 7 " " top, for Schrœteriana read Schröteriana.
" 93, 11 " " top, for *tenebrosa* read *Whitfieldensis* [changed].
" 93, 14 " " top, for *auriculaformis* read *auriculæformis.*
" 100, 2 " " bottom, for *semigranulata* read *semigranulosa.*
" INDEX, after Gon. Whitfieldensis, for (page) 80 read (page) 90.

PART C. ERRATA ET CORRIGENDA OF INDEX TO VOLS. I. TO XI.

Page 5, for aberans read aberrans.
" 5, after acutissimus Misc. Ref. should read Byssus VI. 71, X. 46, 47, XI. 50, Embryo XI. 49.
" 6, after cariosus in "Misc. Ref." add X. 56.
" 7, after Conradicus in "Misc. Ref." should read Byssus VI. 71, X. 46, 47, XI. 50.
" 7, after cor. *Conrad*, insert 42 between XI. and 46.
" 7, for Cumberlandianus read Cumberlandicus.
" 7, after dispar in "soft parts" insert VIII. 10.
" 10, for Leibei read Leibii.
" 11, after naviculoides (Misc. Ref.) insert VII. 30.
" 11, after ochraceus (Misc. Ref.) insert 74 between X. and 91.
" 12, after parvulus (Misc. Ref.) insert XI. 50.
" 12, after phaseolus (Embryo) add 38 after 17.
" 13, after purpurellus (Descript.) read VII. for VIII.
" 13, after rubellinus (Byssus) add XI. 50.
" 15, after velatus *Con.* [Check List] add—is U. Foremanianus *Lea.*
" 19, after petrinus (Misc. Ref.) add IX. 18.
" 19, after Tampicoensis (Misc. Ref.) change 31 to 32.
" 22, after lacteolus *Lea* (Misc. Ref.) add VI. 29.[*]
" 22, for Mousulensis read Mosulensis.
" 23, after rasus (Misc. Ref.) insert XI. 59.
" 23, for Whetleyianus read Wheatleyanus.

Page 24, for Bonelli read Bonellii.
" 24, transfer Schwerzenbackii and Vescoi with their references to pages 31 and 32 [Unio].
" 24, for discoideus *Leach* read discoideus *Lea.*
" 24, below Dahomeyensis insert "doliaris *Lea* (MSS.) Misc. Ref. X. 29."
" 24, date crepera and gracilis July 9, 1850.
" 25, for Schroteriana read Schröteriana.
" 25, after rubens [IRIDINA] Misc. Ref. insert II. 138 before XI.
" 26, after falcata read VII. 41, 42, instead of VI.
" 26, below Neritina insert Niäa *Swainson*, X. 26.
" 29, for discoidea *Leach* read discoidea *Lea.* In brackets similarly.
" 30, after Charruanus Misc. Ref. for VI. 29 read VI. 30.
" 30, below crassus insert crispatus *Gould.* Misc. Ref. VI. 17, 19, 23, 27.
" 30, below delodonta insert delphinulis *Morelet.* XI. 39.
" 31, for Keraurdreni read Keraudreni.
" 31, for lacteolus *Lam.* read lacteolus *Lea*, and refer it to page 22.
" 31, below Peruviana insert petrinus *Gould.* VIII. 41, 54.
" 34, below Coosaensis insert costata *Anth.* Misc. Ref. III. 11.
" 34, after incisa Misc. Ref. add IX. 69.

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[*] Is deloctontus *Lam.* q. v.

Page 34, transfer solida *Lea* with its references to LITHASIA, page 39.
" 34, for tintinabulum read tintinnabulum.
" 36, for Cumberlandiensis read Cumberlandensis.
" 37, for lithasoides read lithasioides.
" 37, after propria Misc. Ref. add IX. 50.
" 39, change the abbreviation (TRI.) to (TRY.) in this and the following pages.
" 39, after adusta (GON) read *Anth.* instead of *Lea.*
" 39, for althea read athleta, and place it under armigera.
" 39, for Bonninensis read Boninensis.
" 39, after bicostata (TRY.) read *Anth.* instead of *Lea.*
" 40, below Buddii insert bulbosa *Gould.* IX. 124.
" 40, for "clavata —?" read clavæformis, and refer to line above.
" 40, below expansa insert fæda *Lea.* XI. 78.
" 41, below Largillierti insert lateritia *Lea.* XI. 79.
" 42, for porcatus read porcata.
" 42, for scilicula read silicula, IX, 124, XI. 82, and transfer to page 43.
" 43, below spinalis insert Spixiana *Lea*, Misc. Ref. II. 93. [Changed.]
" 43, for tuberosa read tenebrosa, and change III. 4 to III. 5, in Misc. Ref.
" 43, after tuberculata Misc. Ref. II. 18 add 93.*
" 44, for Mayhewana read Mayheyana.
" 45 and 46, change the feminine terminations of species of Schizostoma ending in *a* to *um*, neuter.

Page 46, below Hartmanii insert incisum *Lea*, descr. IV. 28, Misc. Ref. IV. 67, IX. 69.†
" 47, for sycamorensis read sycamorense.
" 57, below Cyrena turgida insert Cyrena variegata *D' Orb.* X. 13.
" 57, begin table of genera with Acostæa *D' Orb.* VI. 45.
" 57, below Clausilia insert Columba *Lea.* I. 190, II. 139.
" 58, below Dipsas insert Diplodon *Spix.* VI. 24.
" 58, after Iridina, II. 118, insert 141.
" 58, after Lithasia, between IX. and 40, insert 39.
" 58, below Meseschiza insert—
    Monocondylæa *D' Orb.* II. 135, III. 60, V. 49, VI. 37, 88, VII. 54.
    Mulleria *Fer.* VI, 45.
    Mycetopoda *D' Orb.* II. 142.
    Mycetopus *D' Orb.* X. 35. [XII. 35, 36, 52.]
" 58, below Planorbis insert Pleiodon *Con.* II. 141.
" 58, below Pompholix insert Prisodon *Schum.* IX. 28.
" 58, after Schizostoma, IV. 26, insert 67.
" 59, omit comma between "Branchial" and "uterus," and insert III. 69 before VI. 43.
" 59, after "Byssus of" read VI. 51, 71, X. 46, XI. 50.

APPENDIX TO INDEX VOLS. I. TO XI.

Change printed date of U. marginis to May 16, 1865.
M. Columbensis *Lea* is a young M. Tombigbeensis *Lea.*
For An. Youcanensis read An. Youkanensis.

---

* Changed to Spixiana.

† Originally described as Anc. incisa.

OBSERVATIONS

ON THE

GENUS UNIO,

ETC.

OBSERVATIONS

ON THE

GENUS UNIO;

TOGETHER WITH

DESCRIPTIONS OF NEW SPECIES IN THE FAMILY UNIONIDÆ,

AND DESCRIPTIONS OF

EMBRYONIC FORMS AND SOFT PARTS.

ALSO, NEW SPECIES OF

STREPOMATIDÆ AND LIMNÆIDÆ.

READ BEFORE THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, AND PUBLISHED IN ITS JOURNAL.

BY

ISAAC LEA, LL.D.,

VICE-PRESIDENT OF THE AMERICAN PHILOSOPHICAL SOCIETY, ETC. ETC.

WITH TWENTY-TWO PLATES.

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CONTENTS.

Descriptions of fifty-two species of Unionidæ; read Sept. 15, 1873. Page . . 9
Supplement (fifteen Unionidæ, &c.); read Feb. 3d, 1874. Page 59

TO

JAMES LEWIS, M.D.

My Dear Sir:

The very great and kind assistance you have given me in this and in some previous volumes by procuring me many new Mollusca of the United States, and the sincere interest you have always taken in promoting a knowledge of the fluviatile Mollusca of our country, entitle you to an acknowledgment of these devoted services. In doing this let me add my personal regard and ask you to accept this, my thirteenth volume on this interesting branch of Natural History.

Very truly and sincerely yours,

ISAAC LEA, LL.D.

INTRODUCTION.

In the introduction to Volume XII. I mentioned having new species of *Unionidæ* intended for a future volume. Those are included in this volume, with many subsequently received, chiefly through the great kindness of my friends C. M. Wheatley, Esq., of Phœnixville, Pa., and Dr. James Lewis, of Mohawk, N. Y. Those from the former gentleman are mostly from North Carolina; those from the latter are from the tributaries of the Tennessee River in East Tennessee, and were almost entirely collected by Miss A. E. Law, a most indefatigable collector in that part of the State. My old friend Dr. Schowalter has also contributed something to this volume, as he generally has done for many volumes. Other friends have kindly assisted. I have also had occasion to refer to former contributions of some of my old friends who have been called away from the creations which they studied in this beautiful world—the Rt. Rev. Bishop Elliott, Major Le Conte, Dr. Troost, Dr. Edgar, Dr. Barratt, Mr. Hallenbeck, Dr. Emmons, Dr. Gibbs, Rev. G. White, Mr. J. H. Couper, my brother T. G. Lea, Judge W. Cooper, J. Clark, Judge Tappan, Dr. Budd, etc.

Among other new things I have been enabled to add descriptions of the *soft parts* of some of these interesting animals, as well also, of some *embryonic forms*, which are well represented on Plate 21. I have taken much pains to give accurate representations of the types of species, and these I think will be found generally to be correct.

In this volume I have added 62 species of *Unionidæ*—58 from the United States, and one each from Mexico, Nicaragua, and Guiana. In my twelfth volume I mentioned the number of North American species then known to be 772. By adding 60 to these we have the number 832 species. In the thirteen volumes there are nearly 300 4to plates, representing the species usually with great exactness. It has been remarked that these do not by any means constitute the whole number of existing species—many of the smaller streams falling into our large rivers have not been explored, and these when well searched will, unquestionably, produce new forms of this numerous and interesting family—indeed, I have quite a number of specimens which I cannot satisfactorily place with known species, and these may, when suites are obtained, be satisfactorily proved to be true species. There are also descriptions of three new *Strepomatidæ* and two *Limnæidæ* of the United States.

My cabinet at the present time contains of Unionidæ about 9500 specimens—each one selected for the purpose of representing species, sex, age, habitat, or variety—no specimens are admitted as duplicates.

NEW UNIONIDÆ, ETC.,

CHIEFLY OF THE UNITED STATES.

UNIO GLOBATUS. Pl. 1, fig. 1.

Testa lævi, globosa, valde inflata, valde inæquilaterali; valvulis crassis, antice crassioribus; natibus valde inflatis, parum elevatis; epidermide tenebroso-fusca; dentibus cardinalibus per crassis et valde corrugatis; lateralibus curtis, crassis, parum curvatis corrugatisque; margarita argentea et iridescente.

Shell smooth, globose, very much inflated, very inequilateral; valves thick, thicker before; beaks very much inflated, somewhat raised; epidermis dark brown; cardinal teeth very thick and very much corrugate; lateral teeth short, thick, somewhat curved and corrugate; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 191.

Hab.—Holston River, Dr. Edgar. Etowah River, Geo., Th. Bland.

My cabinet.

Diam. 1·2, Length 1·6, Breadth 1·8 inch.

Shell smooth, globose, very much inflated on the umbones, very inequilateral, rounded before and behind; substance of the shell very thick, thicker before; beaks somewhat raised and much inflated; ligament short, thick, and dark brown; epidermis dark brown, with close marks of growth; umbonial slope rounded; posterior slope cordate and with indistinct lines from the beaks to the margin; cardinal teeth very thick, very much sulcate and roughened, disposed to be treble in the right valve; lateral teeth short, thick and corrugated, and somewhat curved; anterior cicatrices distinct, rather small, and deeply impressed; posterior cicatrices distinct, rather small and well impressed; dorsal cicatrices placed on the under side of the cardinal teeth; cavity of the shell rather shallow and wide; cavity of the beaks rather deep and obtusely angular; nacre silver white and iridescent.

Remarks.—Many years since the late Dr. Edgar sent me two specimens from East Tennessee. I hesitated to consider it a distinct species until I received a third specimen from my friend Mr. Bland, who obtained it from a different habitat. It is a remarkable spherical species, and may be confounded with *subrotundus* on one side, and *subglobatus* herein described on the other. It is a much smaller species than the first, and more rounded than the latter. It need not be confounded with *sphæricus* (nobis), for that species is nodulous and has higher beaks. The three specimens before me differ very little. In the youngest there are a few indistinct rays near the termination of the beaks: none are exhibited on the others. All these specimens have eroded beaks, and therefore their character as to undulation cannot be ascertained.

UNIO VALIDUS. Pl. 1, fig. 2.

Testa lævi, triangulari, inflata, inæquilaterali, antice rotunda, postice obtuse angulata; valvulis crassis, antice aliquanto crassioribus; natibus prominentibus, ad apices undulatis; epidermide olivacea, valde radiata; dentibus cardinalibus crassis, compressis crenulatisque; lateralibus sublongis, crassis subcurvisque; margarita argentea et iridescente.

Shell smooth, triangular, inflated, inequilateral, round before, obtusely angular behind; valves thick, somewhat thicker before; beaks prominent, undulate at the tips; epidermis olive color and very radiate; cardinal teeth thick, compressed, and crenulate; lateral teeth rather long, thick and curved; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 189.

Hab.—Duck River, Tenn., Dr. Powell.

My cabinet.

Diam. 1, Length 1·7, Breadth 2·1 inches.

Shell smooth, triangular, inflated, inequilateral, round before and obtusely angular behind; substance of the shell thick, somewhat thicker before; beaks prominent and undulate at the tips; ligament rather long and dark brown; epidermis olivaceous, with numerous slightly interrupted rays over most of the disks, with distant lines of growth; umbonial slope obtusely angular; posterior slope elliptical, very slightly raised, with obscure rays; cardinal teeth very thick, compressed, crenulate, double in the left and disposed to be treble in the right valve; lateral teeth rather long, thick and disposed to be double in both valves; anterior cicatrices distinct, rather large and deeply impressed; posterior cicatrices distinct, well impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks shallow and obtusely angular; nacre silver white and iridescent.

Remarks.—A full grown specimen received from Dr. Powell many years since. It perplexed me as to its specific value, and I was disposed to think it a variety of *Bigbyensis* (nobis), being very nearly of the same outline. It differs in being more inflated and in having an olive epidermis. It is a stouter shell and has thicker teeth. The tips of the beaks of the specimen before me are somewhat eroded, but there remains enough to display several minute subconcentric undulations.

UNIO SUBGLOBATUS. Pl. 1, fig. 3.

Testa lævi, suborbiculata, valde inflata, inæquilaterali; valvulis per crassis; natibus tumidis, elevatis, incurvis; epidermide tenebroso-fusca, ad apicem maculata et radiata; dentibus cardinalibus parviusculis, compressis sulcatisque; lateralibus crassis, curvatis corrugatisque; margarita argentea et iridescente.

Shell smooth, suborbicular, very much inflated, inequilateral; valves very thick; beaks swollen, elevated, incurved; epidermis dark brown, spotted and radiate towards the tips; cardinal teeth rather small, compressed and sulcate; lateral teeth thick, curved and corrugate; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 191.

Hab.—Florence, Ala., B. Pybas; Nashville, Tenn., Pres. J. B. Lindsley.

My cabinet.

Diam. 1·3, Length 1·6, Breadth 1·8 inch.

Shell smooth, orbicular, very much inflated, inequilateral; substance of the shell very thick, thicker before; beaks very much inflated, very prominent and incurved; ligament short, thick and dark brown; epidermis dark brown, maculate, rayed towards the beaks, and with rather close marks of growth; umbonial slope raised and rounded; posterior slope widely cordate and without rays; cardinal teeth rather small, deeply lobed, compressed, corrugate, and disposed to be treble in the left valve; lateral teeth thick, curved, abrupt at the end and corrugate; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct, rather small, and well impressed; dorsal cicatrices within the cavity of the shell and under the plate, which is very large; cavity of the shell rather deep and rounded; cavity of the beaks very shallow and rounded; nacre silver white and iridescent.

Remarks.—This is the most globose species with which I am acquainted except *capax*, Green, which is a very large and very different species. They cannot be at all compared except in the single character of globosity. I have three specimens before me, all of different ages. The oldest is much eroded at the beaks and umbones, and presents only a few maculations along the umbonial slope. The middle aged and young one have maculated rays and are slightly polished towards the tips. In outline it is allied to *ebenus*, *subrotundus*, and *pilaris* (nobis). It is more inflated than either. It is not so retuse in the beaks as *ebenus*, nor has it so dark an epidermis. It is a smaller species than *subrotundus*, and more inflated. It differs from *pilaris* in having a lighter epidermis, and in being more rotund. Neither of the specimens have beaks perfect enough to present undulations at the lips.

UNIO LAWII. Pl. 2, fig. 4.

Testa lævi, obliqua, clavæformi, antice tumida, valde inæquilaterali, postice obtuse angulata; valvulis crassis, antice aliquanto crassioribus; natibus prominentibus, fere terminalibus; epidermide plavida, radiis interuptis indutis; dentibus cardinalibus paviusculis, acuminatis crenulatisque; lateralibus sublongis, subcurvis lamellatisque; margarita argentea et iridescente.

Shell smooth, oblique, clubshaped, swollen before, very inequilateral, obtusely angular behind; valves thick, rather thicker before; beaks prominent, nearly terminal; epidermis yellowish, covered with interrupted rays; cardinal teeth rather small, acuminate and crenulate; lateral teeth rather long, somewhat curved and lamellar; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 189.

Hab.—Tennessee River, Tuscumbia, Ala., Mr. B. Pybas; Tennessee River, Dr. Edgar; Holston River, Miss Annie E. Law and Prof. Cope.

My cabinet and cabinet of Dr. Lewis.

Diam. 1·1, Length 1·4, Breadth 1·9 inch.

Shell smooth, oblique, clubshaped, swollen before, very inequilateral, obtusely angular behind; substance of the shell thick, somewhat thicker before; beaks prominent and almost terminal, undulate at the tips; ligament short and dark brown; epidermis yellowish with numerous interrupted rays nearly over the whole disk, with rather close lines of growth; umbonial slope rounded; posterior slope cordate, very slightly raised; cardinal teeth small, acuminate, crenulate, double in the left and disposed to be treble in the right valve; lateral teeth rather long, somewhat curved and lamellar; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks shallow and rounded; nacre white and iridescent.

Remarks.—A single young specimen of this species was sent to me at least twenty years since by the late Dr. Edgar. Subsequently, ten or twelve years ago, Mr. Pybas sent me two or three half-grown specimens. Recently I have received from Dr. Lewis, of Mohawk, N. Y., five specimens, two of which are mature. Until the receipt of these I could not satisfy myself entirely that the specimens so long held in doubt were specifically distinct from closely allied species. These at once satisfied all my doubts. More recently I owe to Prof. Cope a single half-grown specimen from the head waters of the Holston River. This species belongs to the group of which *clavus*, Lam., may be considered the type. It differs from that species in not having the beaks so prominent and terminal. It is very closely allied to *Lesleyi* (nobis), but it is not so compressed as that, nor so flat on the sides.

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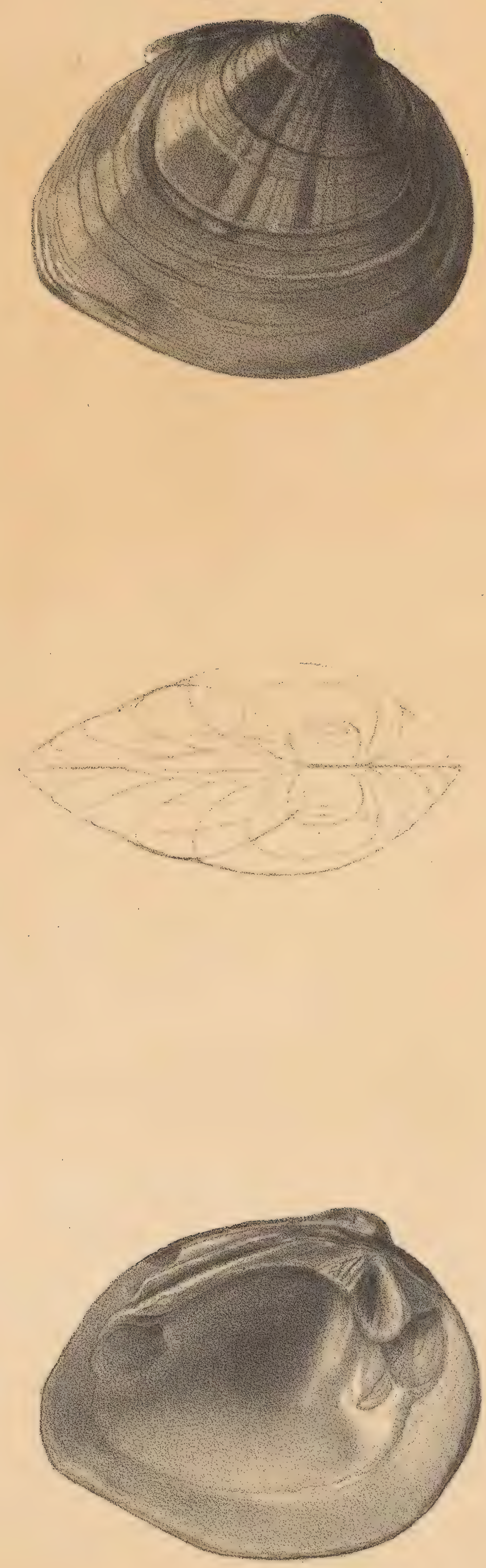

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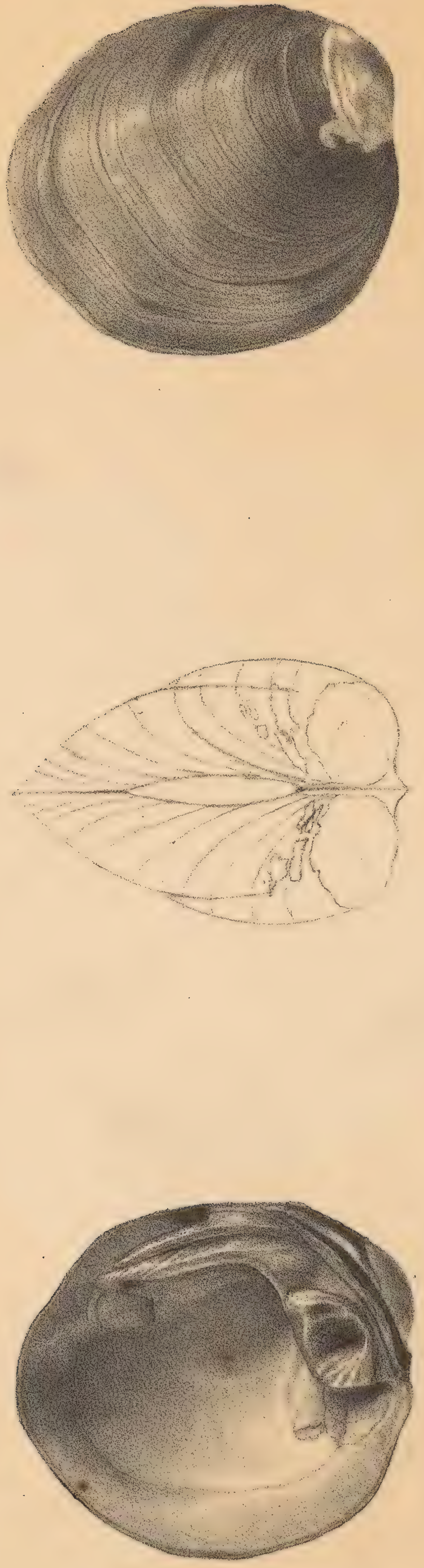

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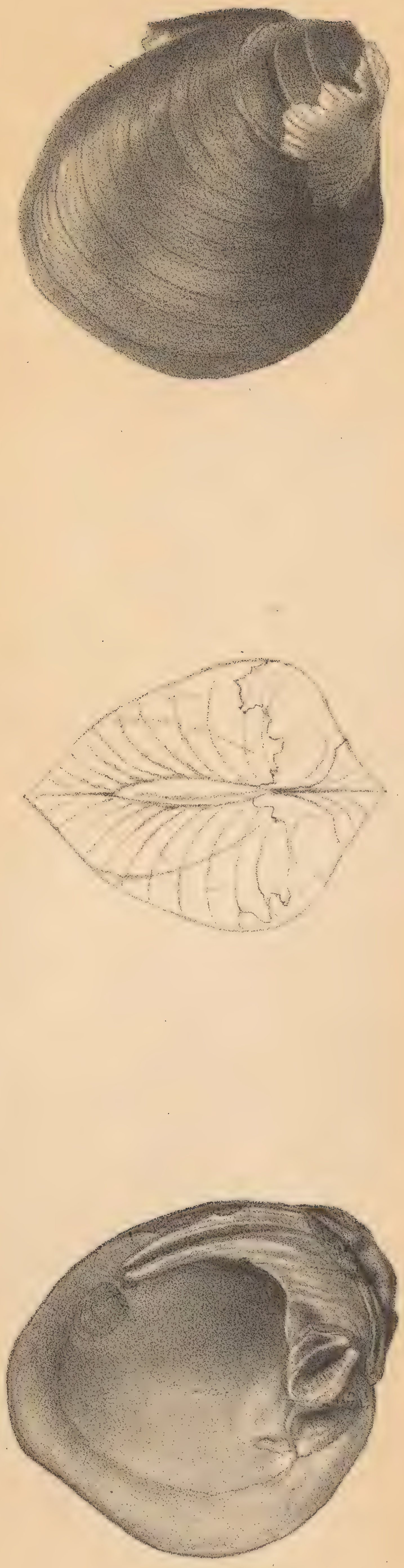


1 *Unio globatus.*
2 *Unio validus.*
3 *Unio subglobatus.*

T. Sinclair & Son, lith. Phila.

It is also near to *Murrayensis* (nobis) and to *mundus* (nobis). One of the young specimens has two or three undulations at the tips of the beaks. I have great pleasure in naming this species after Miss Annie E. Law, of Concord, East Tennessee. She has been a most energetic and successful collector of the mollusks in the streams of that part of the State where she resides, and which have never been so well examined as by herself.

UNIO OBUNCUS. Pl. 2, fig. 5.

Testa lævi, triangulari, subinflata, inæquilaterali, antice rotunda, postice obtuse angulata; valvulis crassis, antice crassioribus; natibus prominentibus; epidermide dilute oliva, perradiata; dentibus cardinalibus parvis corrugatisque; lateralibus crassis, lamellatis corrugatisque; margarita argentea et iridescente.

Shell smooth, triangular, somewhat inflated, inequilateral, round before, obtusely angular behind; valves thick, thicker before; beaks prominent; epidermis pale olive, much radiated; cardinal teeth small and corrugate; lateral teeth thick, lamellar and corrugate; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 192.

Hab.—Tuscumbia, Ala., L. B. Thornton; Holston River, E. Tenn., Miss Law.

My cabinet and cabinet of Dr. Lewis.

Diam. ·8, Length 1·3, Breadth 1·5 inch.

Shell smooth, triangular, somewhat inflated, inequilateral, round before and obtusely angular behind; substance of the shell thick, thicker before; beaks prominent, somewhat pointed; ligament short, rather thick and brown; epidermis pale olive, rayed all over, somewhat polished, with distant marks of growth; umbonial slope raised into an obtuse angle and curved slightly inward towards the basal margin; posterior slope subcordate, with thin rays from the beaks to margin; cardinal teeth small, thick, and much corrugated; lateral teeth thick, lamellar and corrugated; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct, rather small and well impressed; dorsal cicatrices placed along the base of the cardinal tooth; cavity of the shell shallow and wide; cavity of the beaks deep and angular; nacre silvery white and iridescent.

Remarks.—There are seven specimens before me; they were all sent by Miss Law to Dr. Lewis. It is a pretty little species, closely allied to *Edgarianus* (nobis), and has some resemblance to young *Mooresianus* (nobis). Like *Edgarianus* it has fine green rays, but it has not the great inflation of the anterior half of the disk, like that species, nor has it the high polish, nor the deep green rays on the anterior portion. It is also closely allied to *Tuscumbiensis* (nobis), but may be distinguished by its being rather more compressed, having higher beaks, a greener looking epidermis, and in being more pyramidal. In outline it reminds one of the pyramidal form of the young of *pyramidatus* (nobis). Neither of the specimens was perfect enough at the beaks to observe the undulations.

UNIO RECURVATUS. Pl. 2, fig. 6.

Testa lævi, rotundata, valde inflata, valde inæquilaterali, antice rotundata, postice obtuse angulata; valvulis crassis, antice crassioribus; natibus valde prominentibus et recurvatis; epidermide fusca, eradiata; dentibus cardinalibus parvis, crassis sulcatisque; lateralibus percrassis, curtis, subcurvis corrugatisque; margarita argentea et iridescente.

Shell smooth, rounded, very much inflated, very inequilateral, rounded before, obtusely angular behind; valves thick, thicker before; beaks very prominent and recurved; epidermis brown and rayless; cardinal teeth small, thick and sulcate; lateral teeth very thick, short, somewhat curved, and roughened; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 192.

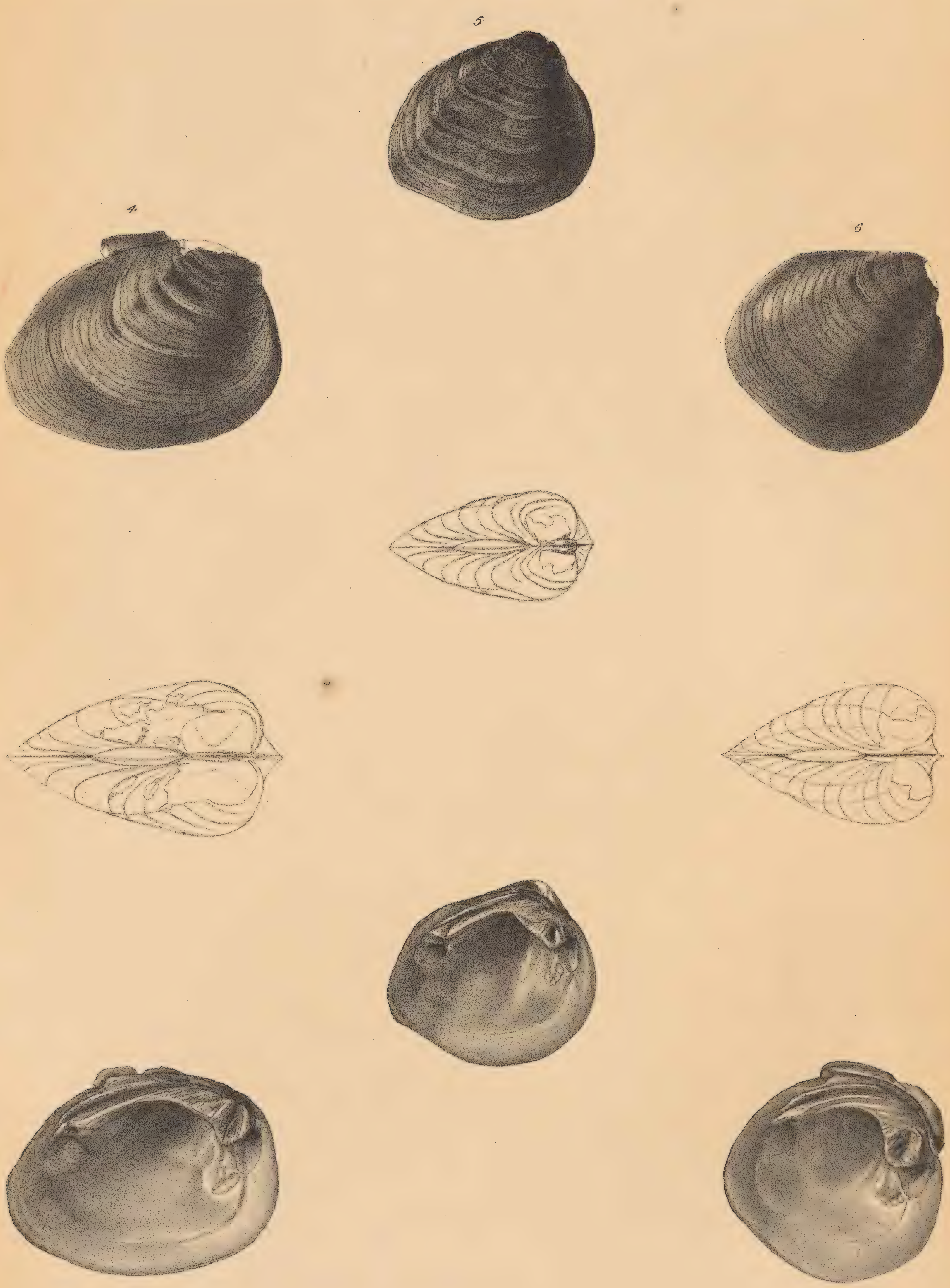
Hab.—Tennessee River, J. G. Anthony; Holston River, E. Tenn., Miss Law.

My cabinet, and cabinets of Mr. Anthony, Mr. Wheatley, and Dr. Lewis.

Diam. 1, Length 1·5, Breadth 1·6 inch.

Shell smooth, rounded, very much inflated, very inequilateral, round before and obtusely angular behind; substance of the shell thick, thicker before; beaks very prominent and much recurved; ligament short, thick and brown; epidermis brown, without rays, and with very close marks of growth; umbonial slope very much raised and obtusely angular; posterior slope cordate; cardinal teeth small, thick, sulcate, and disposed to be treble in the right valve; lateral teeth very thick, short, somewhat curved and corrugate; anterior cicatrices distinct, rather small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks deep and obtusely angular; nacre silvery white and iridescent.

Remarks.—There are three specimens before me. One of them, belonging to Mr. Anthony, has been in my possession for many years. I was never satisfied that it was not a variety of *ebenus* (nobis) until lately, when I received two other specimens, which were sent by Miss Law to Dr. Lewis and Mr. Wheatley. Comparing the three specimens with the allied species, I became entirely satisfied that the species was distinct. In the above description of the epidermis it is said to be without rays. It is very likely that young and perfect specimens may be found with some rays. Two of these specimens have three or four spots immediately



4 *Unio Lawii.*
5 *Unio obuncus.*
6 *Unio recurvatus.*

T. Sinclair & Son, lith, Phila.

under the marks of growth before the umbonial slope. The epidermis is disposed to be rough and slightly scaly, like *plenus* (nobis), and it has a general resemblance to that species, but it is rounded and has not the flattened side of that species. Neither of the specimens is perfect enough in the beaks to display undulations. I owe to the kindness of Dr. Lewis in being able to cite my cabinet for a specimen.

UNIO TUSCUMBIENSIS. Pl. 3, fig. 7.

Testa lævi, triangulari, tumida, ad latere planulata, inæquilaterali, antice subtruncata, postice obtuse angulata; valvulis crassis, antice crassioribus; natibus elevatis, subretusis; epidermide luteo-oliva, perradiata; dentibus cardinalibus parviusculis, subcompressis crenulatisque; lateralibus curtis, subcrassis subrectisque; margarita argentea et iridescente.

Shell smooth, triangular, swollen, flattened at the sides, inequilateral, subtruncate before, obtusely angular behind; valves thick, thicker before; beaks raised, somewhat retuse; epidermis yellowish olive, very much rayed; cardinal teeth rather small, somewhat compressed and crenulate; lateral teeth short, somewhat thick and straight; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 190.

Hab.—Tuscumbia, Ala., L. B. Thornton, Esq.; Holston River, E. Tenn., Dr. Edgar.

My cabinet.

Diam. ·9, Length 1·3, Breadth 1·6 inch.

Shell smooth, triangular, inflated, flattened at the sides, inequilateral, subtruncate before and obtusely angular behind; substance of the shell thick, thicker before; beaks prominent and somewhat retuse; ligament very short, reddish brown; epidermis yellowish olive, rayed nearly over the whole disk, with rather close marks of growth; umbonial slope raised and obtusely angular; posterior slope flattened and cordate; cardinal teeth rather small, somewhat compressed, crenulate, double in the left and treble in the right valve; lateral teeth short, somewhat thick and nearly straight; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed on the under side of the plate within the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks rather deep and obtusely angular; nacre very white and iridescent.

Remarks.—Dr. Edgar more than twenty years since sent me a single specimen of this species, which is so closely allied to *cuneolus* (nobis) that I placed it among that species as a variety. Subsequently Mr. Thornton sent me three of different ages, and I have no longer any doubt but that they are distinct. It may be distinguished from cuneolus by its being more triangular, approaching the outline of typical *obliquus*, Lam. *Tuscumbiensis* is also closely allied to *Edgarianus* (nobis), but differs in being less tumid, less polished, and less extended at the anterior basal margin. None of the specimens are perfect enough at the beaks to exhibit undulation at the tips.

UNIO APPRESSUS. Pl. 3, fig. 8.

Testa lævi, triangulari, securiformi, valde inæquilaterali, antice rotundata, postice subangulata; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominentibus; epidermide flavida, radiis interruptis postice indutis; dentibus cardinalibus paviusculis, compressis crenulatisque; lateralibus sublongis, curvis lamellatisque; margarita argentea et aliquanto iridescente.

Shell smooth, triangular, securiform, very inequilateral, rounded before, subangular behind; valves somewhat thick, somewhat thicker before; beaks prominent; epidermis yellowish, covered behind with interrupted rays; cardinal teeth somewhat small, compressed, and crenulate; lateral teeth rather long, curved, and lamellar; nacre silvery white and somewhat iridescent.

Proc. Acad. Nat. Sci., 1871, p. 189.

Hab.—Tuscumbia, Ala., B. Pybas; Tennessee River, J. G. Anthony; Holston River, Miss Law and C. M. Wheatley.

My cabinet; cabinets of Mr. Anthony and Dr. Lewis.

Diam. ·9, Length 1·5, Breadth 1·7 inch.

Shell smooth, triangular, securiform, very inequilateral, rounded before and obtusely angular behind; substance of the shell somewhat thick, thicker before; beaks prominent; ligament rather short and dark brown; epidermis yellowish, with interrupted rays on the posterior part near to the umbonial slope, with numerous rather close lines of growth; umbonial slope obtusely angular; posterior slope narrow elliptical, slightly raised, and without rays; cardinal teeth rather small, compressed, and crenulate; lateral teeth rather long, curved, lamellar, and rather blunt at the end; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell shallow and rounded; cavity of the beaks rather deep and obtusely angular; nacre very white and somewhat iridescent.

Remarks.—There are six specimens before me; four of them have been with me for many years, laid aside for further and better lights; the other two specimens were recently received from Dr. Lewis, having been obtained from the Holston River by Miss Law. Neither of these six specimens can be placed in any species with which I am acquainted. In outline this species is perhaps nearest to *abacus*, Hald. It differs in being rather less appressed, rather more rounded in outline, and in having interrupted rays. It reminds one of *dolabelloides* (nobis), but it is more triangular. None of the specimens are perfect enough at the beaks to display undulations.

UNIO RADIOSUS. Pl. 3, fig. 9.

Testa lævi, subtriangulari, subinflata, subequilaterali, antice rotundata, postice obtuse angulari; valvulis crassiusculis, antice parum crassioribus; natibus prominentibus; epidermide luteo-oliva, perradiata; dentibus cardinalibus parvis, compressis crenulatisque; lateralibus subcrassis, lamellatis subrectisque; margarita alba et iridescente.

Shell smooth, subtriangular, somewhat inflated, subequilateral, rounded before, obtusely angular behind; valves somewhat thick, somewhat thicker before; beaks prominent; epidermis yellowish-olive, very much rayed; cardinal teeth small, compressed and crenulate; lateral teeth somewhat thick, lamellar and nearly straight; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 192.

Hab.—Holston River, East Tennessee, Miss A. E. Law.

My cabinet, and cabinets of Dr. Lewis, Mr. Wheatley and Miss Law.

Diam. ·7, Length 1·1, Breadth 1·4 inch.

Shell smooth, subtriangular, somewhat inflated, nearly equilateral, rounded before and obtusely angular behind; substance of the shell rather thick, somewhat thicker before; beaks prominent; ligament short, thick and brown; epidermis yellowish-olive, very much rayed, with rather distant marks of growth; umbonial slope raised and obtusely angular; posterior slope cordate and generally rayed; cardinal teeth small, compressed, crenulate and disposed to be treble in the right valve; lateral teeth rather thick, short, lamellar and nearly straight; anterior cicatrices distinct, small and deeply set; posterior cicatrices distinct, small and well impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks rather deep and obtusely angular; nacre white and iridescent.

Remarks.—This species is closely allied to *tumescens* (nobis) in outline, in size and in color of the epidermis. It may, however, be distinguished by *radiosus* being rather more compressed, having a yellowish epidermis with more rays, which usually are broader and greenish. Some of the specimens are nearly covered with beautiful broad green rays. *Tumescens* has higher beaks, a darker epidermis and fewer rays. It is also usually thicker in the substance of the shell. None of the beaks of nearly a dozen before me, sent by Miss Law, are perfect enough to show undulations of the tips. I owe to the kindness of Dr. Lewis the possession of several specimens for my own cabinet.

UNIO CRUDUS. Pl. 4, fig. 10.

Testa lævi, subrotunda, compressa, inæquilaterali, antice rotunda, postice obtuse angulata; valvulis subcrassis, antice crassioribus; natibus prominentibus; epidermide rugosa, tenebroso-fusca, eradiata; dentibus cardinalibus subgrandibus, subcompressis crenulatisque; lateralibus crassis, subbrevis subcurvisque; magarita argentea et parum iridescente.

Shell smooth, subrotund, compressed, inequilateral, rounded before, obtusely angular behind; valves somewhat thick, thicker before; beaks prominent; epidermis rugose, dark brown, without rays; cardinal teeth somewhat large, subcompressed and crenulate; lateral teeth thick, rather short and somewhat curved; nacre silver white and somewhat iridescent.

Proc. Acad. Nat. Sci., 1871, p. 190.

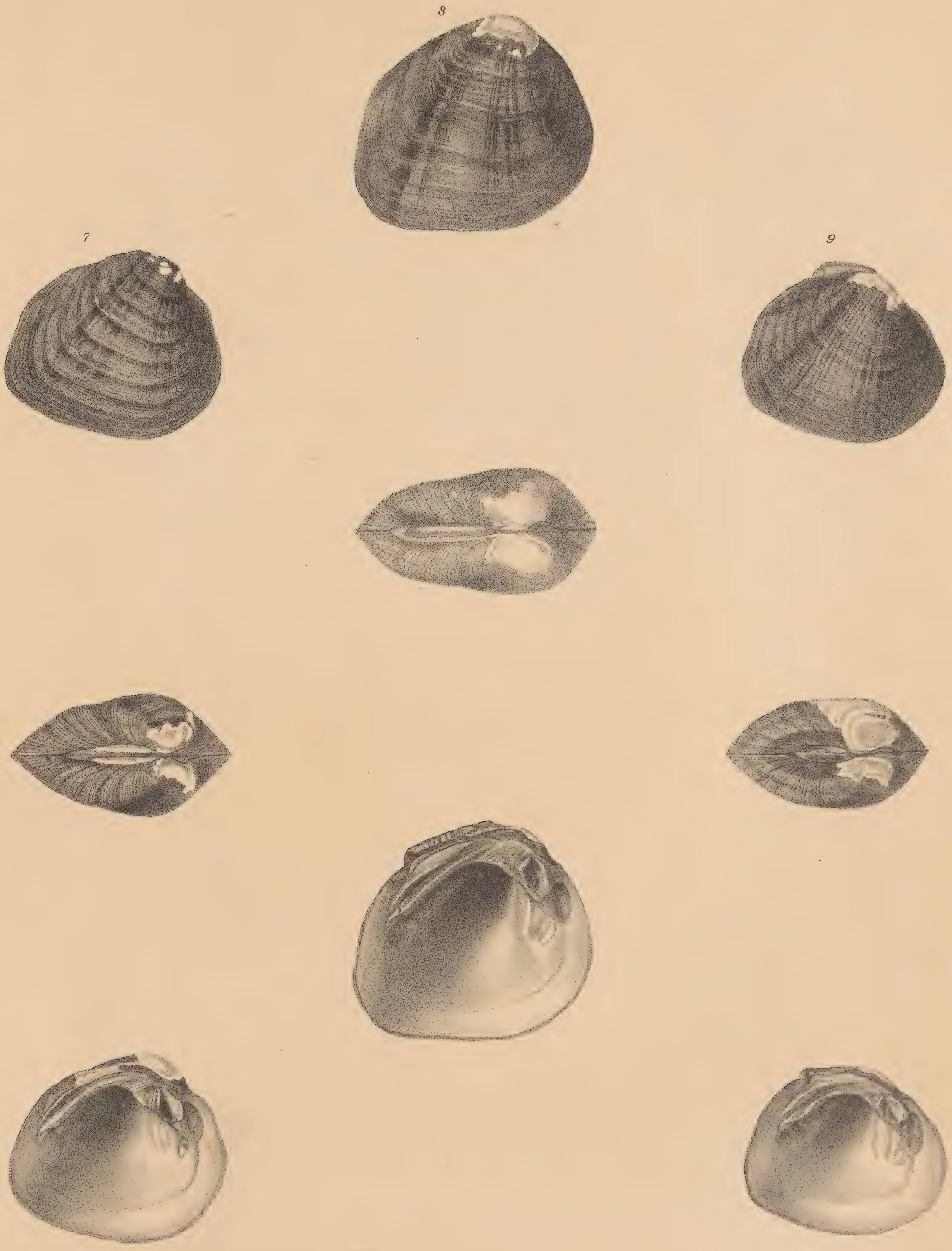
Hab.—French Broad River, Pres. Lindsley; Swamp Creek, Murray Co., Geo., Major Downie; Holston River, C. M. Wheatley and Miss Law.

My cabinet, and cabinets of Mr. Wheatley and Dr. Lewis.

Diam. ·9, Length 1·5, Breadth 1·8 inch.

Shell smooth, subrotund, compressed on the sides, inequilateral, round before and obtusely angular behind; substance of the shell rather thick, much thicker before; beaks prominent, rather pointed; ligament short, rather thick and dark brown; epidermis rough, dark brown, with rather distant marks of growth and without rays; umbonial slope rounded and flattened; posterior slope compressed, cordate, with two slightly impressed lines; cardinal teeth rather large, rather compressed and crenulate; lateral teeth thick, rather short and somewhat curved; anterior cicatrices distinct, rather small, but well impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed on the under side of the plate within the cavity of the beaks; cavity of the shell shallow; cavity of the beaks rather shallow and obtusely angular; nacre silvery white and slightly iridescent.

Remarks.—Among the many shells sent to me some twelve years since by President Lindsley, of Nashville, was a single adult specimen of this species with imperfect beaks. Subsequently a young one was sent by Major Downie, and very recently Mr. Wheatley has sent me an adult and Dr. Lewis two quite young specimens. These last three entirely satisfy my mind that the species is undescribed, and I no longer doubt of its place in the system. The two old specimens are rather rough in the epidermis and present no appearance of rays; but the three young are yellowish, with interrupted dark rays. The outline is rounded, very



7 *Unio Tuscumbiensis.*
8 *Unio appressus.*
9 *Unio radiosus.*

T. Sinclair & Son, lith, Phila.

much like *subrotundus* (nobis), and altogether it is nearly allied to that species. None of the specimens have beaks perfect enough to display undulations at the tips.

UNIO CIRCUMACTUS. Pl. 4, fig. 11.

Testa lævi, rotundata, ad apices inflata, ad basim compressa, inæquilaterali; valvulis crassis, antice crassioribus; natibus elevatis recurvatisque; epidermide vel rufo-fusca vel castanea, maculata et radiata; dentibus cardinalibus crassis, subcompressis sulcatisque; lateralibus percrassis, subcurvis corrugatisque; margarita argentea et valde iridescente.

Shell smooth, rounded, inflated at the beaks, compressed at the base, inequilateral; valves thick, thicker before; beaks raised and recurved; epidermis reddish-brown or chestnut, maculate and rayed; cardinal teeth thick, somewhat compressed and sulcate; lateral teeth very thick, somewhat curved and corrugate; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci., 1871, p. 192.

Hab.—Florence, Ala., Rev. G. White; Holston River, Miss Law.

My cabinet, and cabinets of Mr. Wheatley and Dr. Lewis.

Diam. 1·1, Length 1·8, Breadth 1·9 inch.

Shell smooth, rounded, inflated towards the beaks and compressed at the base, inequilateral; substance of the shell thick, thicker before; beaks much elevated and recurved; ligament thick, short and dark brown; epidermis dark brown or chestnut color, with rather close marks of growth; umbonial slope rounded, not raised; posterior slope narrow, cordate, in some specimens slightly maculate; cardinal teeth thick, somewhat compressed, and disposed to be treble in the right valve, sulcate; lateral teeth very thick, slightly curved and corrugate; anterior cicatrice distinct, rather small and deeply impressed; posterior cicatrices distinct, rather small and well impressed; dorsal cicatrices placed under the cardinal teeth within the cavity; cavity of the shell rather shallow and wide; cavity of the beaks shallow and obtusely angular; nacre silvery white and very iridescent.

Remarks.—This species so closely resembles *Thorntonii* (nobis) that I was induced to place the first I saw with that species as a variety. Having now seven or eight specimens before me, I am satisfied as to the value of the specific difference. All these specimens have a row of maculations immediately before the umbonial slope, extending nearly to the margin. On the anterior half there are rays and on the superior half maculations. This species belongs to the same group with *dolabelloides*, but this species is more rounded on the margin. None of the specimens before me are perfect enough at the tips to present undulations.

UNIO PATTINOIDES. Pl. 4, fig. 12.

Testa lævi, obliqua, subcompressa, valde inæquilaterali, antice rotundata, postice obtuse angulata; volvulis subcrassis, antice crassioribus; natibus sabprominentibus, fere terminalibus; epidermide luteo-brunnea, maculata; dentibus cardinalibus parvis, subcompressis sulcatisque; lateralibus longiusculis, subcompressis corrugatisque; margarita argentea et iridescente.

Shell smooth, oblique, somewhat compressed, very inequilateral, rounded before, obtusely angular behind; valves rather thick, thicker before; beaks somewhat prominent, nearly terminal; epidermis yellowish-brown and maculate; cardinal teeth small, somewhat compressed and sulcate; lateral teeth somewhat long, compressed and corrugate; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 193.

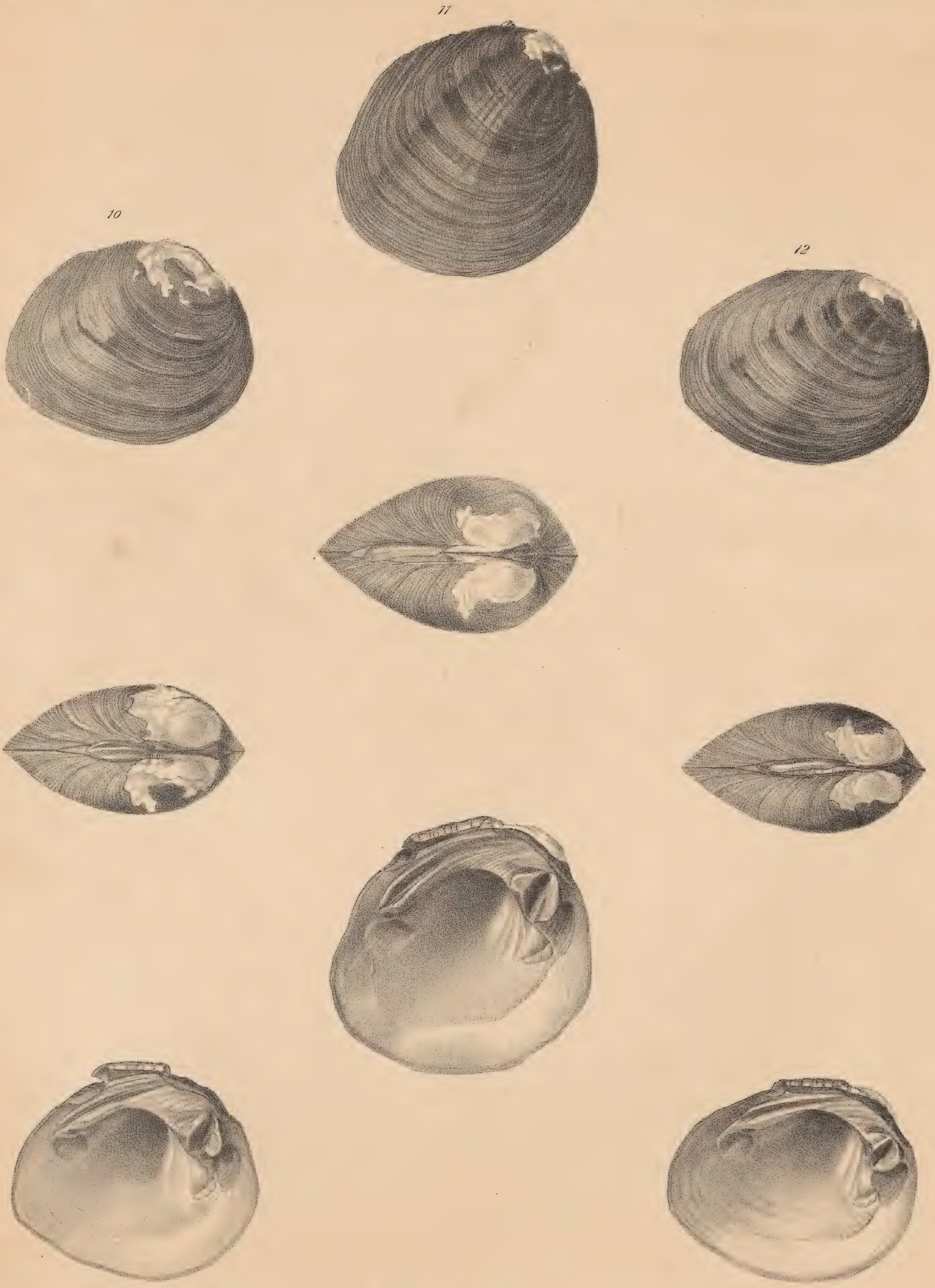
Hab.—Clinch River, Pres. Estabrook; Holston River, Dr. Edgar and Miss Law.

My cabinet, and cabinets of C. M. Wheatley and Dr. Lewis.

Diam. 1, Length 1·4, Breadth 1·8 inch.

Shell smooth, oblique, somewhat compressed, very inequilateral, rounded before and obtusely angular behind; substance of the shell rather thick, thicker before; beaks rather prominent, nearly terminal; ligament rather short, thick and dark brown; epidermis yellowish-brown, spotted with green interrupted rays, with rather close marks of growth; umbonial slope slightly raised and rounded; posterior slope narrow, cordate, occasionally with a few maculations; cardinal teeth small, somewhat compressed and sulcate; lateral teeth rather long, somewhat compressed and corrugate; anterior cicatrices distinct, rather small and deeply impressed; posterior cicatrices distinct, rather small and moderately impressed; dorsal cicatrices placed on the base of the cardinal teeth within the cavity of the shell; cavity of the shell wide and rounded; cavity of the beaks rather deep and angular; nacre silver white and iridescent.

Remarks.—I have had two old and worn specimens of this species for many years, always unable to place them satisfactorily in any described species with which I was acquainted. Recently Miss Law has sent several young and more perfect specimens, and I no longer doubt of their being distinct. In outline it is near to *mundus* and *Lesleyi* (nobis), but *mundus* has higher beaks, and both are rather more oblique. None of these specimens have the beaks perfect enough to show the undulations at the tips.



10 *Unio crudus.*
11 *Unio circumactus.*
12 *Unio pattinoides.*

T. Sinclair & Son, lith. Phila.

UNIO LITUS. Pl. 5, fig. 13.

Testa lævi, elliptica, subcompressa, inæquilaterali, antice rotundata, postice subbiangulata; valvulis subtenuibus, antice crassioribus; natibus prominulis; epidermide crocea, eradiata; dentibus cardinalibus parvis compressisque; lateralibus sublongis, subcurvis lamellatisque; margarita salmonis colore tincta et elegantissime iridescente.

Shell smooth, elliptical, somewhat compressed, inequilateral, rounded before, subbiangular behind; valves rather thin, thicker before; beaks a little prominent; epidermis saffron-yellow, without rays; cardinal teeth small and compressed; lateral teeth rather long, somewhat curved and lamellar; nacre salmon color and elegantly iridescent.

Proc. Acad. Nat. Sci., 1871, p. 189.

Hab.—Cahaba River, Shelby Co., Ala., E. R. Schowalter, M.D.

My cabinet, and cabinet of E. R. Schowalter, M.D.

Diam. ·6, Length 1, Breadth 1·6 inch.

Shell smooth, elliptical, somewhat compressed, inequilateral, rounded before and subbiangular behind; substance of the shell rather thin, thicker before; beaks a little prominent; ligament short and light brown; epidermis saffron-yellow, without rays, with rather distant lines of growth; umbonial slope rounded; posterior slope elliptical and slightly carinate; cardinal teeth small, compressed, double in the left and treble in the right valve; lateral teeth short, oblique, and lamellar; anterior cicatrices confluent, rather large and well impressed; posterior cicatrices large, confluent and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks rather shallow and obtusely angular; nacre salmon color, deeper on the margin, brilliant, satin like, very iridescent.

Remarks.—This is a small species, with a beautiful satin-like nacre. There are two specimens before me; one apparently full grown, the other more than half mature. In color of exterior and general phase it reminds one of *striatulus* (nobis), but it differs in outline, that shell being subtriangular, while *litus* is elliptical. In outline it is very near to *Copei* (nobis), but altogether different in color of epidermis as well as in the nacre. In both specimens before me the beaks are eroded.

UNIO CAHABENSIS. Pl. 5, fig. 14.

Testa valde tuberculata, quadrata, compressa, subæquilaterali, antice rotunda, postice truncata; valvulis subcrassis, antice crassioribus; natibus subprominentibus; epidermide crocea, eradiata; dentibus cardinalibus subgrandis, compressis crenulatisque; lateralibus curtis, obliquis lamellatisque; margarita salmonis colore tincta et elegantissime iridescente.

Shell very much tuberculate, quadrate, compressed, subequilateral, rounded before, truncate behind; valves rather thick, thicker before; beaks rather prominent; epidermis saffron-yellow, without rays; cardinal teeth rather large, compressed and crenulate; lateral teeth short, oblique and lamellar; nacre salmon color and elegantly iridescent.

Proc. Acad. Nat. Sci., 1871, p. 190.

Hab.—Cahaba River, Shelby Co., Ala., E. R. Schowalter, M.D.

My cabinet, and cabinet of E. R. Schowalter, M.D.

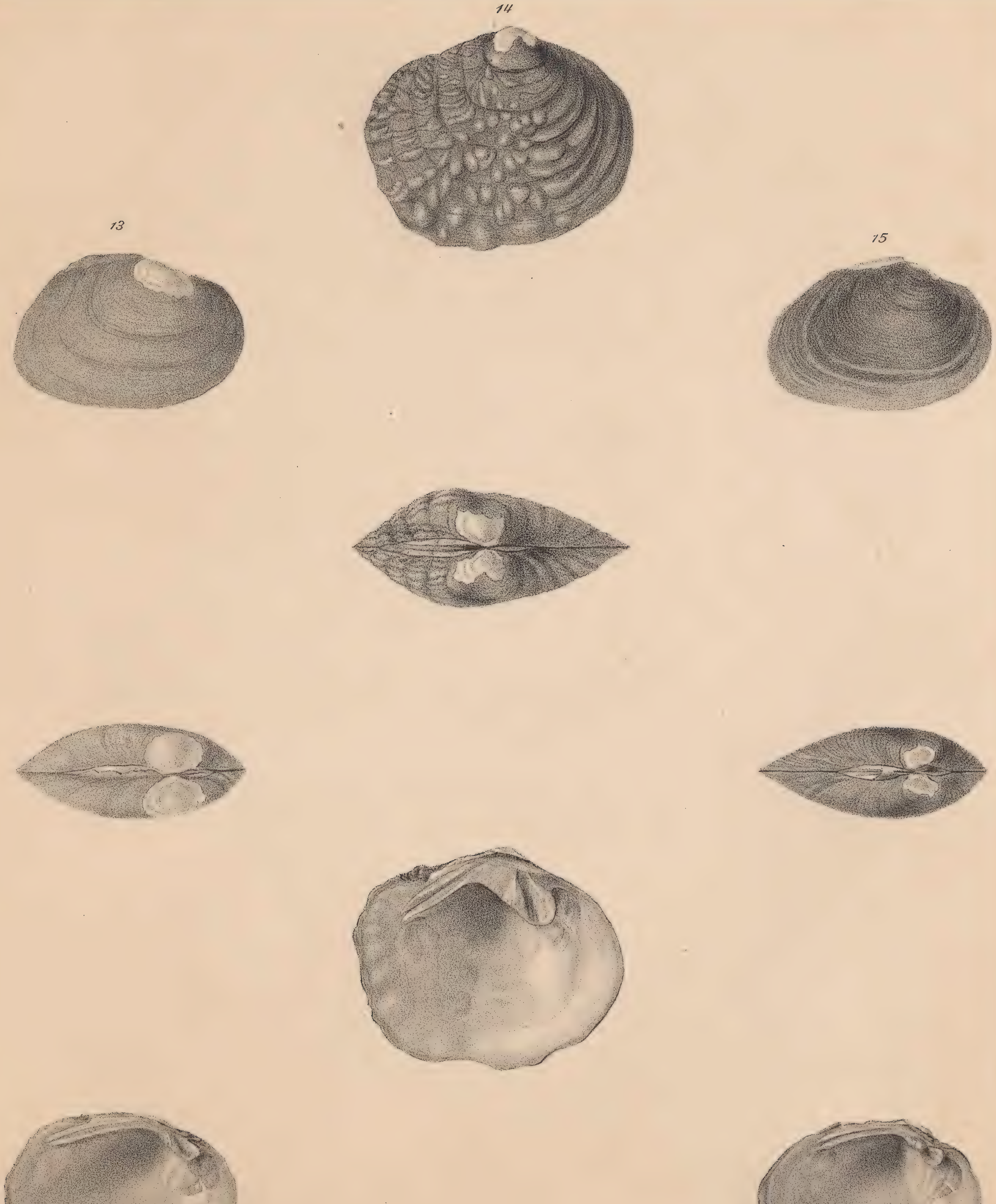
Diam. ·8, Length 1·5, Breadth 1·8 inch.

Shell tuberculate nearly over the whole disk, quadrate, subequilateral, round before and truncate behind; substance of the shell rather thick, much thicker before; beaks somewhat prominent; ligament short, rather dark; epidermis saffron-yellow, without rays, with distant lines of growth; umbonial slope flattish; posterior slope compressed, carinate, with many small tubercles; cardinal teeth rather large, compressed, crenulate, double in the left and treble in the right valve; lateral teeth short, oblique, lamellar and straight; anterior cicatrices distinct and well impressed; posterior cicatrices distinct and slightly impressed; dorsal cicatrices placed within the cavity of the beaks; cavity of the beaks deep and angular; cavity of the shell shallow and wide; nacre salmon color, splendent and satinlike, deeper colored on the margin.

Remarks.—Two specimens only were sent by Dr. Schowalter. The larger appears to be full grown; the smaller rather more than half mature. The beautiful salmon color and satinlike nacre of these specimens are very remarkable, the color extending from the margin into the cavity of the beaks. It belongs to the quadrate nodulous group which contains *lachrymosus*, *pustulatus*, *Schoolcraftii*, &c., the outline and compressed form being nearly the same with the latter. It differs entirely in having very numerous tubercles over three-fourths of the disk, the anterior fourth being somewhat welted. It is devoid of the broad green ray which is usually so well defined in *Schoolcraftii*, no appearance of rays being in the two specimens before me. The very remarkably fine nacre displays a series of irregular undulations, caused by the exterior tubercles. The beaks of both specimens being eroded, present no undulations.

UNIO SIMULANS. Pl. 5, fig. 15.

Testa lævi, obliqua, subcompressa, inæquilaterali, antice rotundata, postice obtuse angulata; valvulis crassiusculis, antice crassioribus; natibus prominentibus; epidermide tenebroso-fusca, eradiata; dentibus cardinalibus parvis, compressis crenulatisque; lateralibus sublongis, curvis lamellatisque; margarita alba et iridescente.



13 *Unio litus*
14 *Unio Cahabensis*
15 *Unio simulans*

[illegible]

Shell smooth, oblique, somewhat compressed, inequilateral, rounded before and obtusely angular behind; valves rather thick, thicker before; beaks a little prominent; epidermis dark brown without rays; cardinal teeth small, compressed, and crenulate; lateral teeth somewhat long, curved and lamellar; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 190.

Hab.—Cahaba River, Shelby Co., Ala., E. R. Schowalter, M.D.

My cabinet, and cabinet of Dr. Schowalter.

Diam. ·6, Length 1, Breadth 1·5 inch.

Shell smooth, oblique, somewhat compressed, inequilateral, rounded before, obtusely angular behind; substance of the shell somewhat thick, somewhat thicker before; beaks a little prominent; ligament short and dark brown; epidermis dark brown, nearly black, without rays and with rather distant marks of growth; umbonial slope rounded; posterior slope narrow elliptical, with two indistinct rays on each valve, scarcely carinate; cardinal teeth small, compressed and crenulate; lateral teeth rather long, curved and lamellar; anterior cicatrices distinct, rather small, deeply impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks somewhat deep and obtusely angular; nacre white and iridescent behind.

Remarks.—Four specimens of this species were sent to me by Dr. Schowalter. They seem all to be males. The species seems to be more nearly allied to *U. Genthii* (nobis) than any other I am acquainted with. It differs in being more compressed, and in being a little more oblique. When young the color of the epidermis is no doubt a dark green. The most perfect specimen shows a disposition to exhibit that color. None of the specimens had beaks perfect enough to show undulations at the tips, which no doubt they possess when young.

UNIO DISPANSUS. Pl. 6, fig. 16.

Testa lævi, elliptica, subinflata, valde inæquilaterali, antice rotunda, postice obtuse angulata; valvulis crassiusculis, antice crassioribus; natibus prominulis, fere terminalibus; epidermide tenebroso-olivacea, perradiata; dentibus cardinalibus parviusculis tuberculatis et in utroque valvulo duplicibus; lateralibus prolongis, lamellatis subrectisque; margarita purpurea et valde iridescente.

Shell smooth, elliptical, somewhat inflated, very inequilateral, round before and obtusely angular behind; valves somewhat thick, thicker before; beaks a little prominent, nearly terminal; epidermis dark olive, very much rayed; cardinal teeth rather small, tuberculate and double in both valves; lateral teeth very long, lamellar and nearly straight; nacre purple and very iridescent.

Proc. Acad. Nat. Sci., 1871, p. 191.

Hab.—East Tennessee, Dr. Edgar.

My cabinet.

Diam. ·8, Length 1·2, Breadth 2·2 inches.

Shell smooth, narrow elliptical, somewhat inflated, very inequilateral, round before and obtusely angular behind; substance of the shell somewhat thick, thicker before; beaks rather prominent, nearly terminal; ligament rather long and dark brown; epidermis dark olive and very much rayed on the posterior portions, with rather close marks of growth; umbonial slope slightly raised and rounded; posterior slope narrow elliptical; cardinal teeth rather small, tuberculate and double in both valves; lateral teeth very long, lamellar and nearly straight; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of shell rather deep and wide; cavity of the beaks shallow and nearly rounded; nacre purple and very iridescent.

Remarks.—Among the shells sent to me many years since were two specimens which I could not place with any I was acquainted with. These have been laid aside with the hope of getting others of different ages, better to satisfy myself. Since then, among all the many *envois* from East Tennessee, I have never seen a third specimen. I am now, however, satisfied from the view of many allied species, that these must be placed in the group of *rutilans* (nobis) as distinct, being near to that and *subellipsis* (nobis). It is not so large a species as *rutilans*, nor so transverse, and differs in having a purple nacre, and in this respect differs from *subellipsis*, to which it has a strong resemblance. The nacre of the two specimens before me is purple in the cavity, being more intense towards the cavity of the beaks, and inclining to salmon color towards the margin. It is exceedingly brilliant in the posterior half of the disk. The beaks being eroded, the undulations of the tips were not observable. Dr. Edgar did not mention the particular habitat of those specimens, but they probably came from the Holston River.

UNIO SANTEENSIS. Pl. 6, fig. 17.

Testa lævi, suboblonga, subinflata, valde inæquilaterali, antice rotundata, postice obtuse biangulata; valvulis crassiusculis, natibus prominulis, ad apices minute undulatis; epidermide tenebroso-fusca, nitida et valde radiata; dentibus cardinalibus parvis, compressis et in utroque valvulo duplicibus; lateralibus longis subcurvisque; margarita vel purpurea vel salmonis colore tincta et iridescente.

Shell smooth, somewhat oblong, somewhat inflated, very inequilateral, rounded before, obtusely biangular behind; valves somewhat thick; beaks slightly prominent, minutely undulate at the tips; epidermis dark brown, shining, and very much radiate; cardinal teeth small, much compressed and double in both valves; lateral teeth long and somewhat curved; nacre purple or salmon colored and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 193.

Hab.—Santee Canal, So. Car., Dr. Foreman; and Oconee River, Geo., Major J. Le Conte.

My cabinet.

Diam. ·9, Length 1·4, Breadth 2·5 inches.

Shell smooth, somewhat oblong, rather inflated, very inequilateral, rounded before, obtusely biangular behind; substance of the shell a little thick; beaks a little prominent, minutely undulate at the tips; ligament rather long and dark brown; epidermis dark brown, shining and very much rayed, with very distant marks of growth; umbonial slope inflated and rounded; posterior slope narrow elliptical and with two slightly impressed lines from the beaks to the posterior margin; cardinal teeth small, compressed, double in both valves; lateral teeth long and somewhat curved; anterior cicatrices distinct and well impressed; posterior cicatrices large, confluent and moderately impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and rounded; nacre purplish, tinted with salmon and iridescent.

Remarks.—This species is closely allied to *confertus* (nobis) and *lugubris* (nobis), and belongs to the great *complanatus* group. It is rather more compressed than either of them, and is not quite so elongate. In color of epidermis and rays it resembles both. Three specimens have been in my collection for many years, and they were placed with a doubt as a variety of *lugubris.* I no longer hesitate to believe it to be a distinct species.

UNIO RADIOLUS. Pl. 6, fig. 18.

Testa lævi, elliptica, subinflata, valde inæquilaterali, antice rotunda, postice obtuse angulata; valvulis crassiusculis; natibus prominulis, fere terminalibus; epidermide brunnea, valde radiata; dentibus cardinalibus parvis, subcompressis crenulatisque; lateralibus longis, lamellatis subcurvisque; margarita alba et iridescente.

Shell smooth, elliptical, somewhat inflated, very inequilateral, round before, obtusely angular behind; valves somewhat thick; beaks a little prominent, nearly terminal; epidermis brownish, very much radiate; cardinal teeth small, somewhat compressed and crenulate; lateral teeth long, lamellar and somewhat curved; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 192.

Hab.—Ogeechee River, Liberty Co., Geo., Major John Le Conte.

My cabinet and cabinet Academy Natural Sciences.

Diam. ·8, Length 1·1, Breadth 2·1 inches.

Shell smooth, narrow elliptical, somewhat inflated, inequilateral, round before and obtusely angular behind; substance of the shell somewhat thick; beaks a little prominent and nearly terminal; ligament rather short, rather thick and dark brown; epidermis brownish, very much rayed and with distant marks of growth; umbonial slope raised and obtusely angular; posterior slope narrow elliptical and raised into a small carina; cardinal teeth small, compressed and crenulate; lateral teeth long, lamellar and somewhat curved; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, rather large and moderately impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and rounded; nacre white and iridescent.

Remarks.—I owe to the kindness of my friend, the late Major John Le Conte, a small suite of this species which some twenty years since he brought from Georgia. For a long time I considered these specimens to belong to *Geddingsianus* (nobis) from South Carolina. Having more recently given them a careful comparison with that species, I have no longer any hesitation in separating them. It is a smaller species, has a higher umbonial slope, is a little more transverse and has more and closer rays. It need not be confounded with *aquilus* (nobis), from Georgia, which is a more compressed species and is larger. The young specimens show delicate undulations at the tips of the beaks.

UNIO STEVENSII. Pl. 7, fig. 19.

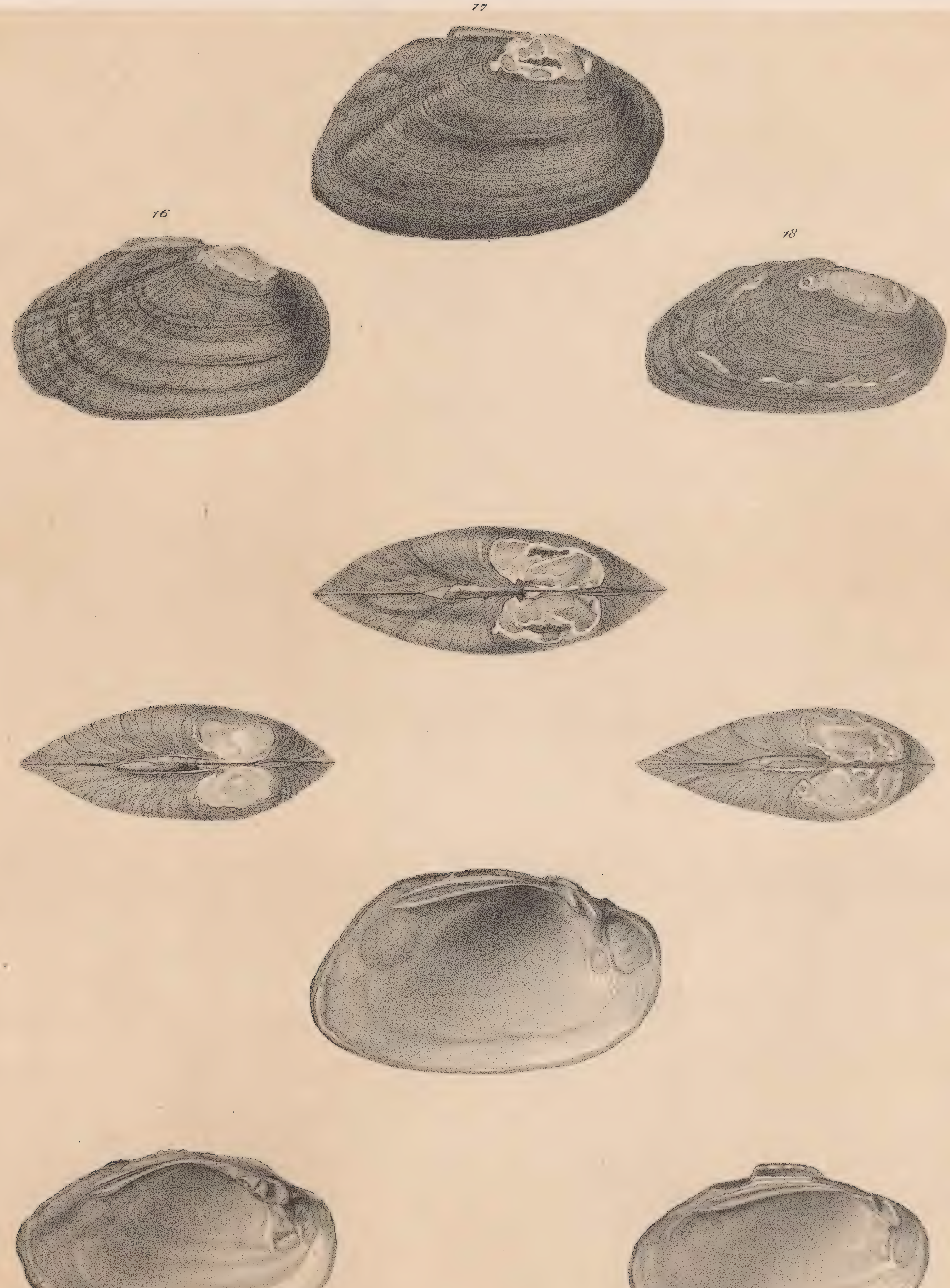
Testa bialata, valde plicata, triangulari, compressa, valde inæquilaterali; valvulis crassiusculis, antice crassioribus; natibus vix prominentibus; epidermide tenebroso-cornea, eradiata; dentibus cardinalibus parvis sulcatisque; lateralibus longis, lamellatis subcurvisque; margarita alba et iridescente.

Shell double winged, very much folded, triangular, compressed, very inequilateral; valves somewhat thick, thicker before; beaks scarcely prominent; epidermis dark horn color, without rays; cardinal teeth small and sulcate; lateral teeth long, lamellar and somewhat curved; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 188.

Hab.—Yuruari River, tributary to Essequebo River, Guiana, R. P. Stevens.

My cabinet and cabinet of C. M. Wheatley.



16 *Unio dispansus*
17 *Unio Santeënsis*
18 *Unio radiolus*

[illegible]

Diam. 1, Length 1·8, Breadth 2·5 inches.

Shell bialate, folded nearly all over, triangular, compressed, very inequilateral; substance of the shell somewhat thick, thicker before; beaks scarcely prominent, with radiating folds at the tips; ligament concealed, long and dark brown; epidermis dark horn color, in the younger light horn color, without rays and with rather distant marks of growth; umbonial slope very slightly raised; posterior slope narrow elliptical and raised into a high wing; cardinal teeth small, sulcate; lateral teeth long, lamellar and slightly curved; anterior cicatrices confluent, rather small and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row across the cavity of the beaks; cavity of the shell very shallow and wide; cavity of the beaks very shallow and rounded; nacre white and iridescent.

Remarks.—I owe to the kindness of Mr. Stevens three specimens, two adults and young one about one-third grown. The outline is very nearly that of *Boykinianus* (nobis) and it is plicate like that shell nearly all over; but it differs in being a thinner and smaller shell, and in having more and smaller folds. In the young shell before me the folds extend over the whole disk and some of them take a zigzag form. This is a symphynote species and the high wing in perfect specimens covers the ligament. In the two older specimens this character is lost, but in the young specimen it is evident that the two valves were connate before and behind the beaks. In all the three specimens the cardinal teeth are much divided and therefore disposed to be sulcate.

I have great pleasure in dedicating this species to Mr. Stevens, to whom I am under obligations for it and other interesting river shells taken by him in Guiana, viz., *Unio fluctiger*, *An. tortilis*, *An. ensiformis* and *Mel. transversa.*

UNIO JEFFREYSIANUS. Pl. 7, fig. 20.

Testa crebre et leviter sulcata, regulariter elliptica, compressa, parum inæquilaterali; valvulis crassiusculis, antice parum crassioribus; natibus prominulis; epidermide tenebroso-fusca, polita, eradiata; dentibus cardinalibus, parvis, lamellatis, obliquis; lateralibus longis, lamellatis, subrectis et in utroque valvulo simplicibus; margarita vel alba vel salmonis colore tincta.

Shell closely and slightly sulcate, regularly oval, compressed, somewhat inequilateral; valves somewhat thick, slightly thicker before; beaks a little prominent; epidermis dark brown, polished, without rays; cardinal teeth small, lamellar and oblique; lateral teeth long, lamellar, nearly straight and simple in both valves; nacre white or salmon colored.

Proc. Acad. Nat. Sci., 1871, p. 188.

Hab.—Australia, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. 1, Length 1·7, Breadth 2·8 inches.

Shell closely and slightly sulcate, regularly elliptical, compressed, slightly inequilateral; substance of the shell somewhat thick, somewhat thicker before; beaks a little prominent; ligament very thin, long and nearly concealed; epidermis dark brown, shining, without rays, with very distant marks of growth; umbonial slope very slightly raised and rounded; posterior slope carinate, narrow elliptical; cardinal teeth small, lamellar, oblique, double in the right and single in the left valve; lateral teeth long, lamellar, nearly straight and single in both valves; anterior cicatrices confluent, large and slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre white or salmon color and slightly iridescent.

Remarks.—I owe to my friend Mr. Wheatley the possession of the specimen figured. He has two similar ones in his extensive and valuable collection. This species is remarkable for having the lateral teeth *single* in *both valves.* The cardinal teeth are small, and double only in the right valve, the upper lobe of the tooth of which is very small. The lines of growth are broad and very distant. The beaks are too imperfect to exhibit their character. In outline it is near to *Thwaitesii* (nobis), but it is higher in the carina than that shell and differs in the teeth as well as in the character of sulcation of the disk, *Thwaitesii* being smooth. It resembles also *vittatus* (nobis), but that species is more inflated, the beaks more terminal, and the marks of growth very much closer. It cannot be confounded with Lamarck's *Australis*, that species being smooth and obovate. (See *Philippi's Conchylien*, Tab. 5, fig. 5.)

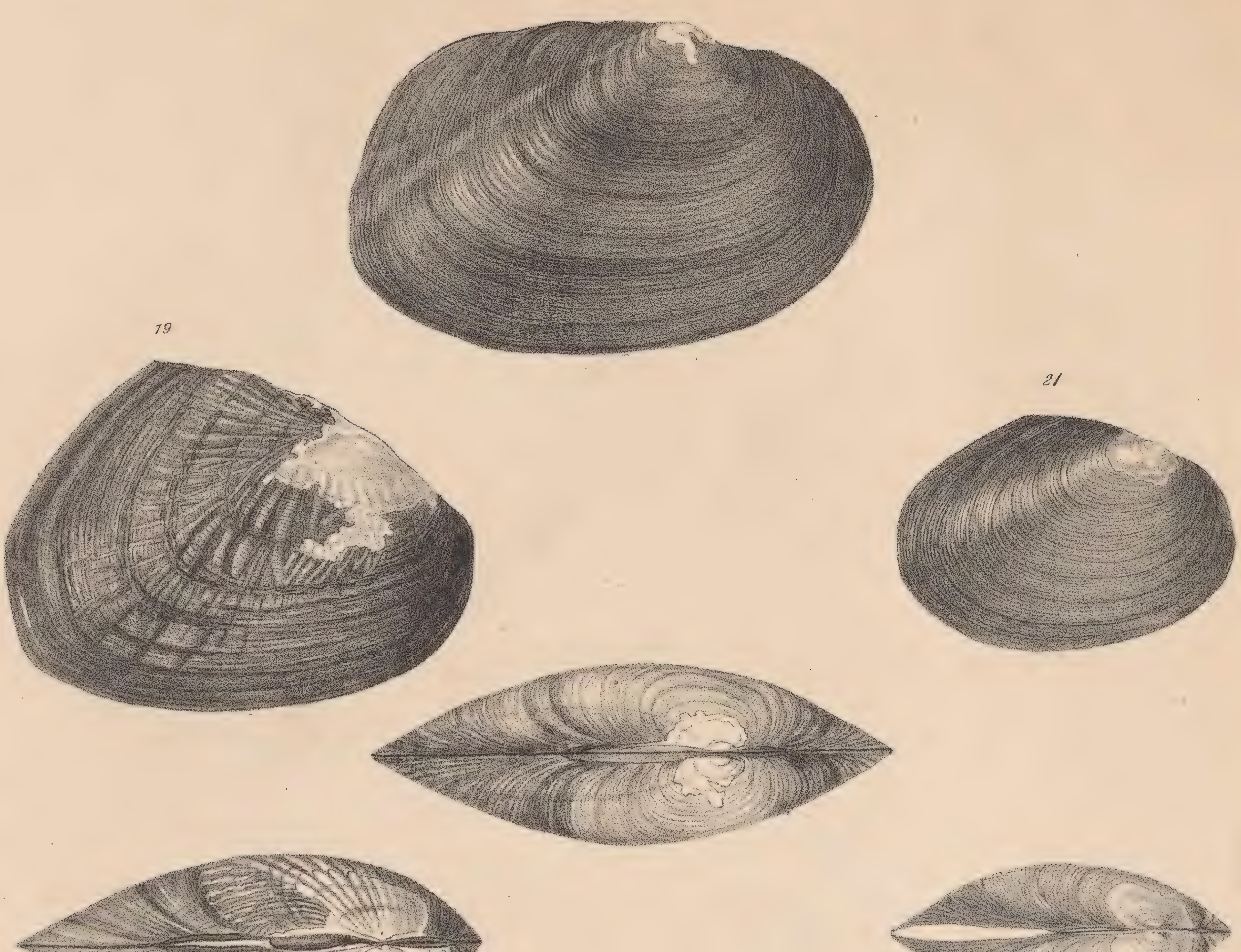
I have great pleasure in dedicating this species to the distinguished and able author of British Conchology, &c., J. Gwyn Jeffreys, F.R.S., &c. &c.

ANODONTA EXILIOR. Pl. 7, fig. 21.

Testa alata, lævi, obovata, inflata, valde inæquilaterali; valvulis exilissimis; natibus prominulis, ad apices minute undulatis; epidermide vel olivacea vel brunea, polita et eradiata; margarita cœrulea et valde iridescente.

Shell winged, smooth, obovate, inflated, very inequivalve, valves exceedingly thin; beaks somewhat prominent, minutely undulate at the tips; epidermis olive or brown, polished and without rays; nacre blue and very iridescent.

Proc. Acad. Nat. Sci., 1871, p. 188.



19 *Unio Stevensii.*
20 *Unio Jeffreysianus.*
21 *Anodonta exilior.*

T. Sinclair & Son, lith. Phil.

Hab.—Mexico, C. M. Wheatley.

Diam. ·7, Length 1·3, Breadth 1·8 inch.

Shell winged, smooth, obovate, inflated, very inequilateral; substance of the shell exceedingly thin; beaks a little prominent, at the tips very minutely undulate and pointed; ligament rather long, dark brown and nearly concealed; epidermis olive color or brownish, polished, without rays, and with distant marks of growth; umbonial slope inflated and rounded; posterior slope elliptical, raised into a wing; anterior cicatrices confluent, large and very slightly impressed; posterior cicatrix confluent and very slightly impressed; dorsal cicatrices placed across the cavity of the shell and very slightly impressed; cavity of the shell deep and rounded; cavity of the beaks exceedingly shallow; nacre bluish and very iridescent.

Remarks.—This very delicate species was kindly given to me by Mr. Wheatley, who obtained it from a London dealer as coming from Mexico. The habitat, therefore, is not positively certain. It does not appear to me to be a Mexican species. There are three specimens before me. The oldest one is dark brown with a polished epidermis, while the youngest is greenish olive. The very delicate nacre, which is translucent, has very minute striæ passing from the centre of the beaks to all parts of the margin. In outline it is closely allied to *A. obtusa* (Spix.), Testacea Fluv. Braziliencia, Tab. xxii. figs. 3 and 4; but differs entirely in the thinness of the valves, in not having rays, and in being higher in the wing.

UNIO MACNIELII. Pl. 8, fig. 22.

Testa sulcata, oblonga, valde inæquilaterali, antice sub-rotunda, postice obtuse biangulata; valvulis crassiusculis, antice crassioribus; natibus prominulis; epidermide fusca vel luteola, postice viridiradiata; dentibus cardinalibus parviusculis, compressis crenulatisque; lateralibus sublongis lamellatisque; margarita argentea et valde iridescente.

Shell sulcate, oblong, very inequilateral, rounded before, obtusely biangular behind; valves somewhat thick, thicker before; beaks slightly prominent; epidermis brownish or yellowish, with green rays posteriorly; cardinal teeth rather small, compressed and crenulate; lateral teeth rather long and lamellar; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1869, p. 124.

Hab.—Rio Gigillillo, Corcuera, Nicaragua, Cen. Am., Mr. J. A. McNiel.

My cabinet, and cabinet of the Peabody Academy Nat. Sci., Salem.

Diam. ·7, Length 1·, Breadth 1·7 inch.

Shell sulcate, oblong, very inequilateral, rounded before, obtusely biangular behind; substance of the shell somewhat thick, thicker before; beaks slightly prominent; ligament rather short and light brown; epidermis brownish, in the young yellowish, with green rays behind, with scarcely perceptible lines of growth; umbonial slope rounded; posterior slope carinate, compressed, with two well-marked impressed lines from beaks to margin; cardinal teeth small, compressed, crenulate and disposed to be double in both valves; lateral teeth rather long, lamellar and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent and moderately impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell somewhat deep; cavity of the beaks rather shallow and obtusely angular; nacre silver white and very iridescent.

Soft Parts.—No ova were found in the ovaries or branchial uterus. *Branchia* rather small, inner one the larger, curved below, free the whole length of abdominal sac. *Palpi* large, round below, united near to the top. *Mantle* very thin, thicker and colored at the margin. *Branchial Opening* rather large, light brown, with numerous small papillæ. *Anal Opening* large, dark brown, with numerous very minute papillæ on inner edges. *Super-Anal Opening* very small, colored, united below—color of the mass whitish.

Remarks.—I have before me a number of specimens of different ages. This species has a general resemblance to the Nicaraguan species, and is somewhat like *Rowellii* (nobis), but may be distinguished by the difference of outline, *Macnielii* being oblong, having nearly the outline of *Scamnatus Morelet,* from Cuba. I have pleasure in calling it after Mr. McNiel, who discovered it while travelling in Central America. I owe to the liberality of the Peabody Acad. Nat. Sci. of Salem the possession of specimens and the privilege of describing the species.

UNIO PEALEI. Pl. 8, fig. 23.

Testa lævi, rotunda, valde inflata, subglobosa, valde inæquilaterali, antice et postice rotundata; valvulis crassis, antice crassioribus; natibus elevatis, tumidis, subretusis; epidermide luteo-olivacea, dilute perradiata; dentibus cardinalibus paviusculis, subconicis; lateralibus longis, crassis subrectisque; magarita argentea et iridescente.

Shell smooth, round, very much inflated, subglobose, very inequilateral, round before and behind; valves thick, thicker before; beaks raised, swollen and somewhat retuse; epidermis pale olive with rather indistinct rays over the whole disk; cardinal teeth rather small, subconical; lateral teeth long, thick and nearly straight; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 191.

Hab.—Kansas, Mr. C. W. Peale.

Cabinet Academy Natural Sciences.

Diam. 1·2, Length 1·7, Breadth 2 inches.

Shell smooth, round, very much inflated, subglobose, very inequilateral, rounded before and behind; substance of the shell thick, much thicker before; beaks raised, swollen, somewhat retuse; ligament rather large and light brown; epidermis yellowish olive, with rather indistinct rays over the whole disk, and with rather distant marks of growth; umbonial slope rounded; posterior slope elliptical, with two indistinct impressed lines on each valve from the beak to the margin; cardinal teeth rather small, subconical, double in the left and treble in the right valve; lateral teeth long, thick and nearly straight; anterior cicatrices distinct, rather small and deeply impressed; posterior cicatrices confluent, rather large and well impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks shallow and obtusely angular; nacre beautifully white and iridescent.

Remarks.—A single specimen only was brought by Mr. Peale from Kansas. It is always to be regretted that a description should be made from a single specimen, as the species of this genus often vary exceedingly. In outline it is perhaps nearest to *ebenus* (nobis), but it has not the high retuse beaks of that species, nor its dark margin or peculiar party color of the young shell. In the epidermis it is totally different. It is not quite so round as *circulus* (nobis), and differing so much in the epidermis, cannot be confounded with that species. In the color of the epidermis and indistinct rays it is allied to *ellipsis* (nobis), but it is not so oblique. The beaks are nearly perfect, and show indistinctly very minute undulations at the tips. I dedicate the species to Mr. Peale, who presented it to the Academy with many other species from the distant habitat of Kansas.

UNIO ACUENS. Pl. 8, fig. 24.

Testa lævi, triangulari, compressa, valde inæquilaterali, antice rotundata, postice subbiangulata; valvulis crassiusculis, antice crassioribus; natibus prominentibus; epidermide luteola, radiis interruptis; dentibus cardinalibus subcrassis, subcompressis crenulatisque; lateralibus subcrassis, brevis subrectisque; margarita alba et iridescente.

Shell smooth, triangular, compressed, very inequilateral, rounded before and subbiangular behind; valves somewhat thick, thicker before; beaks prominent; epidermis yellowish, with interrupted rays; cardinal teeth somewhat thick, somewhat compressed and crenulate; lateral teeth somewhat thick, short and nearly straight; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1871, p. 190.

Hab.—Holston River, near Concord, East Tennessee, Miss A. E. Law.

My cabinet and cabinet of Dr. Lewis.

Diam. ·7, Length 1, Breadth 1·2 inch.

Shell smooth, triangular, compressed, flattened at the sides, very inequilateral, rounded before and subbiangular behind; substance of the shell rather thick, thicker before; beaks prominent, almost terminal; ligament short and light brown; epidermis yellowish, with a few interrupted maculate rays near the umbonial slope, with close marks of growth; umbonial slope obtusely angular; posterior slope compressed cordate; cardinal teeth rather thick, somewhat compressed and crenulate; lateral teeth rather thick, short and nearly straight; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct, small and well impressed; dorsal cicatrices placed on the under side of the plate, within the cavity of the beaks; cavity of the shell very shallow; cavity of the beaks shallow and obtusely angular; nacre white and very iridescent.

Remarks.—Three specimens are before me, all found by Miss Law in the Holston River and sent to Dr. Lewis, to whom I am obliged for the advantage of describing the species and having one of them in my cabinet. In outline this species is near to *Clinchensis* (nobis), but may be distinguished at once by its flattened sides and more terminal beaks. In the marks of growth they differ much, *acuens* having them much closer. In regard to the interrupted green rays they are very similar, but in *Clinchensis* these are more numerous and spread more over the disk. This species is also closely allied to *mundus* (nobis), but it is more compressed and less oblique. The only three specimens I have seen are nearly of the same size and are, I presume, adults. The beaks are too much eroded to present the character of undulations. Each of the specimens presents about a dozen marks of growth.

UNIO FLAVIDUS. Pl. 9, fig. 25.

Testa lævi, triangulari, subinflata, ad latere planulata, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis subcrassis, antice crassioribus; natibus prominentibus, recurvatis, ad apices minute undulatis; epidermide flavida, radiis interruptis; dentibus cardinalibus parvis corrugatisque; lateralibus curtis, subcrassis subcurvisque; margarita argentea et iridescente.

Shell smooth, triangular, somewhat inflated, flattened at the sides, obtusely angular behind and rounded before; valves somewhat thick, thicker before; beaks somewhat prominent, incurved, minutely undulate at the tips; epidermis yellowish, with interrupted rays; cardinal teeth small and corrugate; lateral teeth short, rather thick and somewhat curved; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1872, p. 156.

Hab.—Clinch River, Anderson Co., and Holston River, East Tenn., Miss A. E. Law; North Alabama, Rev. G. White.

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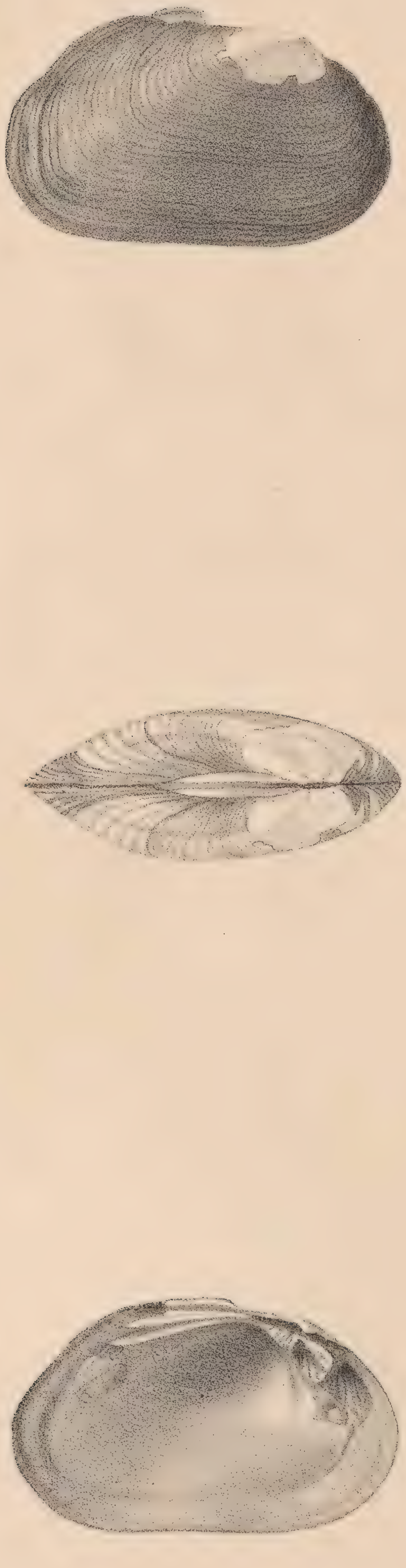

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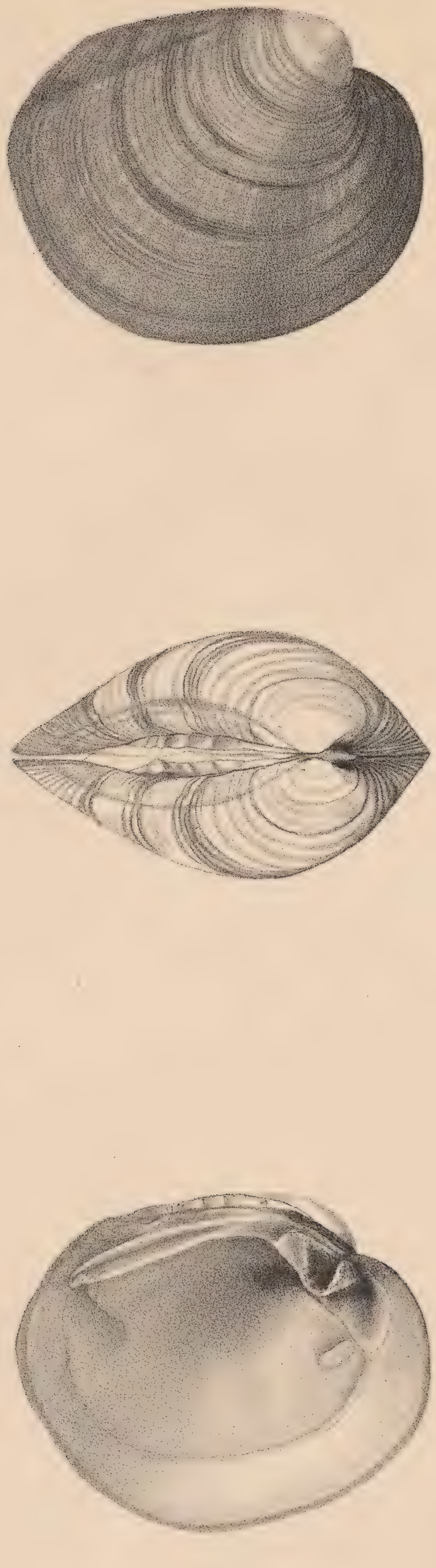

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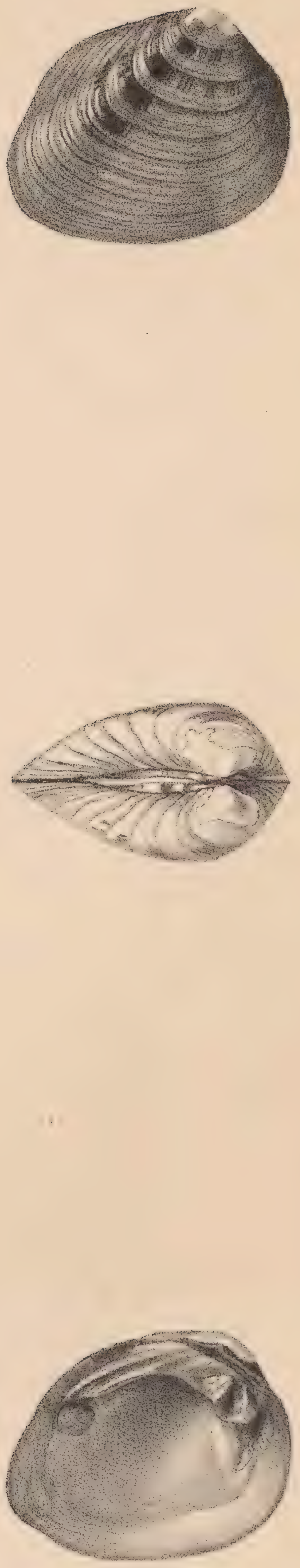

22 *Unio Macnielii*
23 *Unio Pealei*
24 *Unio acuens.*

T. Sinclair & Son, lith. Phila.

My cabinet and cabinets of Dr. Lewis and Mr. Wheatley.

Diam. ·7, Length 1·2, Breadth 1·4 inch.

Shell smooth, triangular, somewhat inflated, flattened at the sides, obtusely angular behind and rounded before; substance of the shell somewhat thick, thicker before; beaks somewhat prominent, incurved, minutely undulate at the tip; ligament short, thick and light brown; epidermis yellowish, with interrupted green rays over about half of the disk, with rather close marks of growth; umbonial slope obtusely angular; posterior slope cordate, with an indistinct impressed line from the beaks to the margin; cardinal teeth small and corrugate; lamellar teeth short, rather thick, corrugate and somewhat curved; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices within the cavity of the beaks; cavity of the shell shallow; cavity of the beaks somewhat deep and angular; nacre silver white and iridescent.

Remarks.—This is another of Miss Law's species from Clinch River, and belongs to that group of triangular smooth *Uniones* of which *obliquus*, Lam. may be considered the type. It is very nearly of the same outline, but is more compressed, is a thinner shell and has not the beaks so much elevated. It also has some resemblance to *rubiginosus* (nobis), but is not rubiginose nor quite so angular. In outline very near to *Tuscumbiensis*, but more inflated. It may easily be distinguished from *tumescens* (nobis), an allied species, by the latter being more inflated and being of a darker color. The specimen from North Alabama sent to me many years since by Mr. White, is larger than the four from Miss Law, and is higher in the beaks, is more inflated and has more distant marks of growth. Indeed, Mr. White's specimen may prove, when we have more to examine, to be really distinct.

UNIO PAUCIPLICATUS. Pl. 9, fig. 26.

Testa plicata, subrotunda, ventricosa, valde inæquilaterali, postice carinata, antice rotundata; valvulis crassis, antice crassioribus; natibus prominentibus, tumidis, recurvatis, ad apices minute undulatis; epidermide rufo-fusca, eradiata; dentibus cardinalibus crassis, elevatis, sulcatis crenulatisque; lateralibus longis, lamellatis, corrugatis subcurvisque; margarita argentea et valde iridescente.

Shell plicate, subrotund, very much inflated, very inequilateral, carinate behind and rounded before; valves thick, thicker before; beaks prominent, swollen, recurved and minutely undulate at the tips; epidermis reddish-brown, without rays; cardinal teeth thick, raised, sulcate and crenulate; lateral teeth long, lamellar, corrugate and slightly curved; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 156.

Hab.—Austin, Texas, Prof. C. G. Forshey, C. E.

My cabinet, and cabinets of Acad. Nat. Sci. and C. M. Wheatley.

Diam. 1·3, Length 2, Breadth 2·5 inches.

Shell plicate, subrotund, very ventricose, very inequilateral, carinate behind and rounded before; substance of the shell thick, thicker before; beaks prominent, swollen, recurved and minutely undulate at the tips; ligament long, thick and dark brown; epidermis reddish-brown, without rays, with very distant marks of growth; umbonial slope rounded; posterior slope carinate, with an impressed line in each valve from the beak to the margin; cardinal teeth thick, raised, sulcate, crenulate and disposed to be treble in the right valve; lateral teeth long, lamellar, corrugate and slightly curved; anterior cicatrices distinct, rather large, deeply impressed and very corrugate; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed on the under side of the cardinal teeth; cavity of the shell deep and rounded; cavity of the beaks deep and obtusely angular; nacre silver white and very iridescent.

Remarks.—Several specimens of this species were received from Prof. Forshey, with *purpuratus* Lam., *gracilis* Bar., *Berlandierii* (nobis), etc. When first received, I was disposed to think it to be a marked variety of *plicatus*, Lesueur, but it differs from that species in being rotund and in having fewer folds. In some specimens the folds are so obsolete as scarcely to be observed. The color of the epidermis is also different from *plicatus*. It has a rufous disposition mingling with a slight greenish tint in the only specimen before me, which is not old. All the specimens were dead shells. The inclination to redness in the epidermis is marked by a line of the hue around the margin of the nacre. The beaks of a single specimen are perfect enough to trace two or three very minute undulations at the tips. In its rotundness and some other characters it is closely allied to *Brazosensis* (nobis), and when good suites of both shall be obtained it may prove to be only a variety of that species.

UNIO LENTICULARIS. Pl. 9, fig. 27.

Testa lævi, subrotunda, compressa, lenticulari, subæquilaterali; postice obtuse biangulari, antice rotunda; valvulis subtenuibus, antice crassioribus; natibus prominulis; epidermide vel tenebroso-fusca vel luteo-fusca, obsolete radiata; dentibus cardinalibus parvis, compressis crenulatisque; lateralibus sublongis, lamellatis, corrugatis subcurvatisque; margarita albida et iridescente.

Shell smooth, rounded, compressed, lenticular, nearly equilateral, obtusely biangular behind, round before; valves rather thin, thicker before; beaks a little prominent; epidermis dark brown or yellowish-brown, obscurely rayed; cardinal teeth

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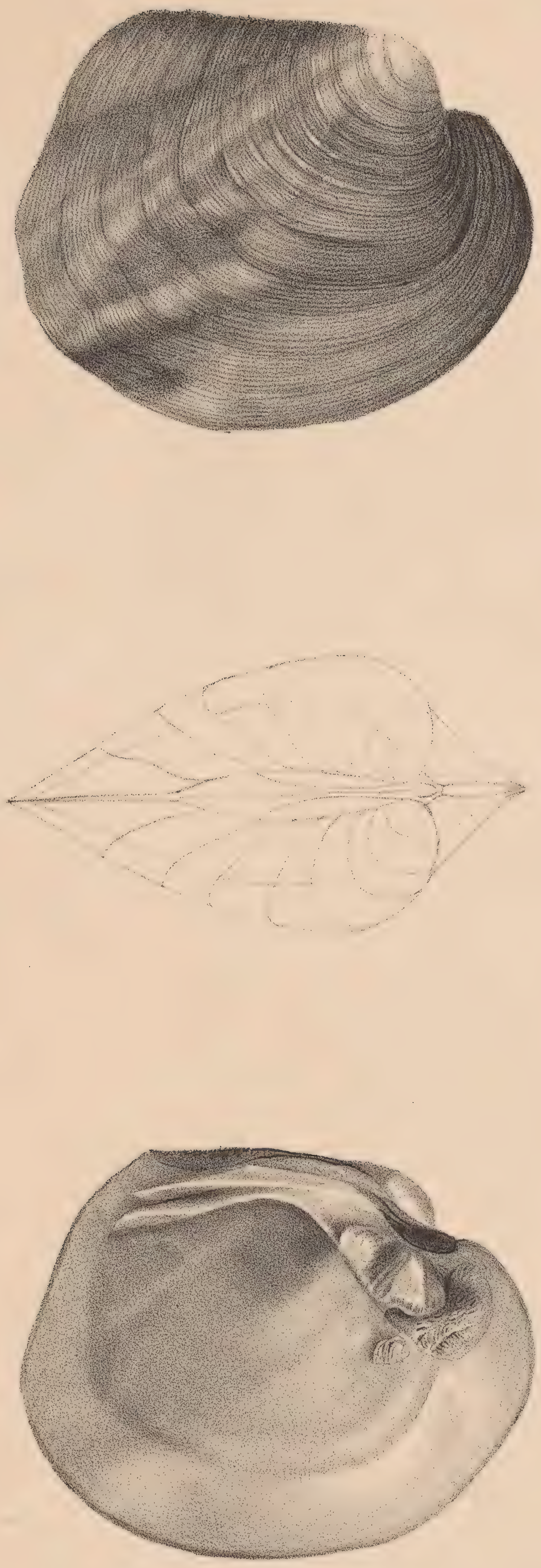

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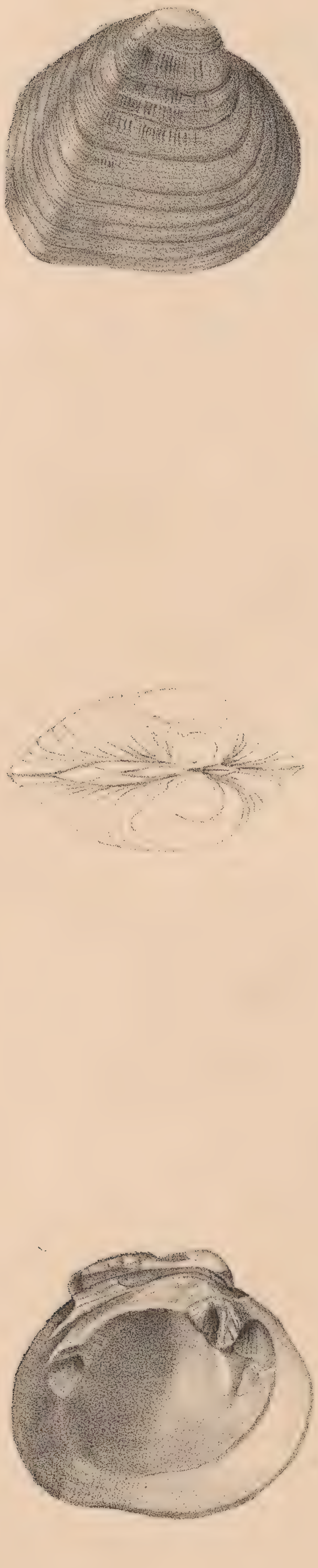

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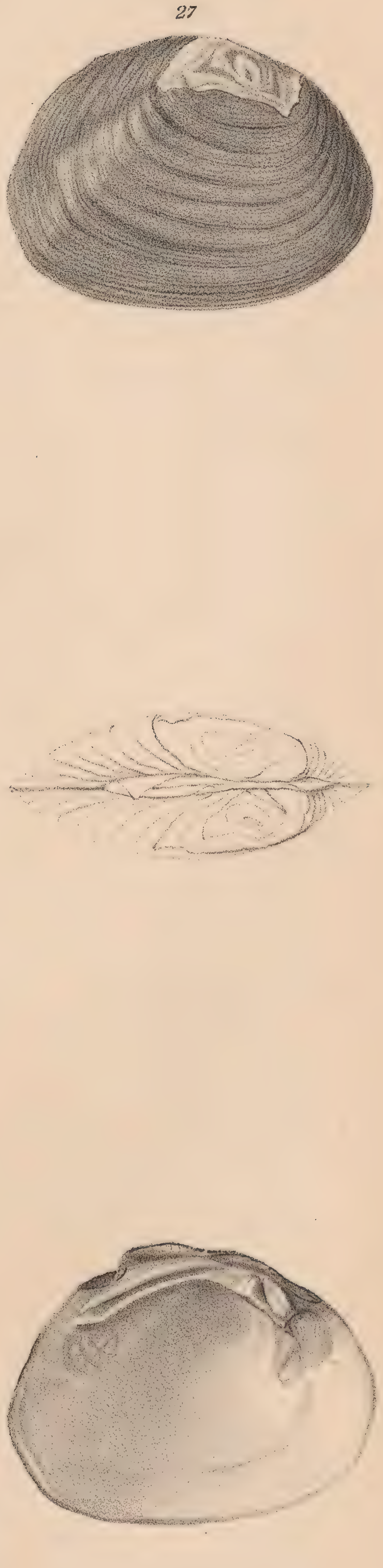


25 *Unio flavidus*
26 *Unio pauciplicatus.*
27 *Unio lenticularis.*

T. Sinclair & Son. lith. Phila.

small, compressed and crenulate; lateral teeth rather long, lamellar, corrugate and slightly curved; nacre whitish and iridescent.

Proc. Acad. Nat. Sci., 1872, p. 155.

Hab.—Tellico River, Monroe Co., East Tennessee, Miss A. E. Law.

My cabinet and cabinets of Dr. Lewis and C. M. Wheatley.

Diam. ·7, Length 1·3, Breadth 1·7 inch.

Shell smooth, rounded, compressed, lenticular, nearly equilateral, obtusely biangular behind, round before; substance of the shell rather thin, thicker before; beaks a little prominent; ligament rather short, somewhat thin and light brown; epidermis dark brown or yellowish-brown, obscurely rayed and with close marks of growth; umbonial slope rounded; posterior slope compressed, subcarinate; cardinal teeth small, compressed, crenulate and very slightly curved; anterior cicatrices confluent, well impressed; posterior cicatrices distinct and moderately impressed; dorsal cicatrices placed on the upper side of the cavity of the beaks; cavity of the shell shallow, dishlike; cavity of the beaks rather shallow and obtusely angular; nacre white and iridescent.

Remarks.—Several specimens are before me. The figured specimen is subcircular and well characterizes the species. Some of the others are inclined to be more oblique, particularly where the beaks have been much eroded. In outline it is nearest to *Chickasawhensis* (nobis), but not quite so round, nor is it so much inflated. It is also a smaller species, has less robust cardinal teeth, and has closer marks of growth. This species is allied to *lens* (nobis), but that is compact and heavier. The rays on *lenticularis* are all, as those before me indicate, nearly obsolete. In young specimens the epidermis may be found to be yellowish-green and the interrupted rays no doubt well developed. None of the specimens sent by Dr. Lewis have beaks sufficiently preserved to exhibit undulations.

UNIO TELLICOENSIS. Pl. 10, fig. 28.

Testa lævi, subtriangulari, subinflata, inæquilaterali, postice obtuse angulata, antice rotunda; valvulis crassiusculis, antice parum crassioribus; natibus subprominentibus; epidermide crocata, polita, parum radiata; dentibus cardinalibus parvis, crenulatis, conicis; lateralibus curtis, subcrassis subrectisque; margarita salmonis colore tincta et valde iridescente.

Shell smooth, subtriangular, somewhat inflated, inequilateral, obtusely angular behind, round before; valves somewhat thick, a little thicker before; beaks somewhat prominent; epidermis brownish-saffron, polished, slightly radiated; cardinal teeth small, crenulate and conical; lateral teeth short, somewhat thick and nearly straight; nacre light salmon color and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 155.

Hab.—Tellico River, Monroe Co., East Tennessee, Miss A. E. Law; East Tennessee, J. C. Anthony.

My cabinet, and cabinet of Mr. J. C. Anthony.

Diam. ·7, Length 1·8, Breadth 1·7 inch.

Shell smooth, subtriangular, somewhat inflated, inequilateral, obtusely angular behind and round before; substance of the shell somewhat thick, a little thicker before; beaks somewhat prominent; ligament small and dark brown; epidermis brownish-saffron, polished, with a few short interrupted, indistinct rays and with close marks of growth; umbonial slope obtusely angular; posterior slope compressed, cordate, with slightly impressed lines from the beaks to the margin; cardinal teeth small, crenulate and conical; lateral teeth short, somewhat thick and nearly straight; anterior cicatrices distinct, rather small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed on the upper side of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks rather deep and subangular; nacre light salmon color, deeper towards the margin, very iridescent.

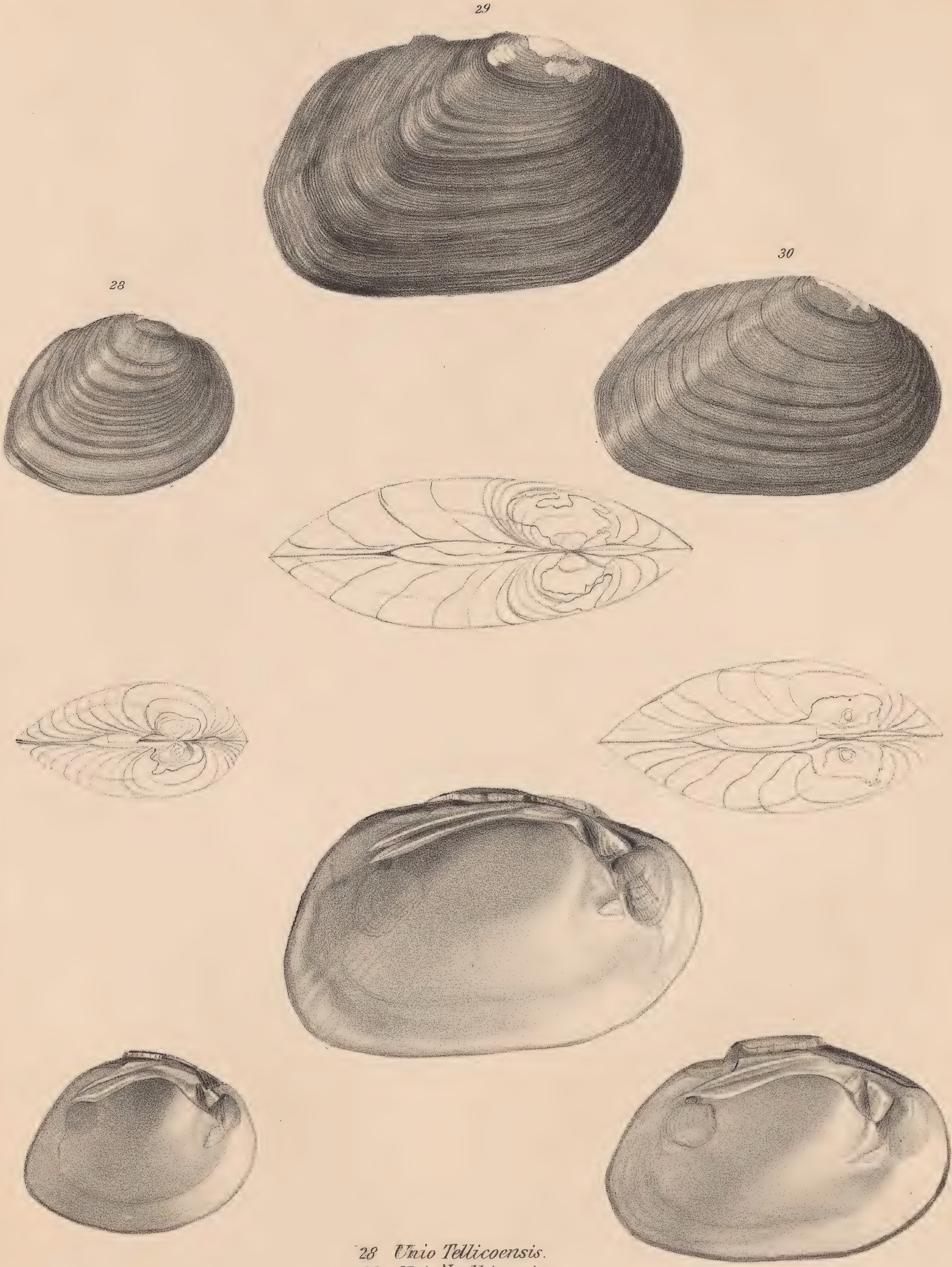
Remarks.—Two specimens only are before me; one was obtained by Miss Law and sent to Dr. Lewis, of Mohawk, N. Y. To him I am indebted for the possession of it. The other was found by Mr. Anthony. In outline this species is nearest to *glandaceus* (nobis), but may easily be distinguished by its being less inflated, less thick in the substance of the valves, in having a polished epidermis, closer marks of growth, and in the color being brownish-saffron. In the specimens before me there are only a few close interrupted pencil rays. Other specimens may be likely to have more rays, and some may be totally devoid of them. The beaks being eroded, no undulations can be observed. The color and polish of the epidermis are somewhat like those of *pyriformis* (nobis).

Unio Yadkinensis. Pl. 10, fig. 29.

Testa lævi, oblonga, compressa, valde inæquilaterali, postice subbiangulata, antice rotundata; valvulis crassis; natibus prominulis; epidermide tenebroso-fusca, eradiata; dentibus cardinalibus parviusculis, compressis, corrugatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis, corrugatis subcurvisque; margarita vel salmonea vel purpurea et valde iridescente.

Shell smooth, oblong, compressed, very inequilateral, subbiangular behind, rounded before; valves thick; beaks slightly prominent; epidermis dark brown, without rays; cardinal teeth rather small, compressed, corrugate and double in both valves; lateral teeth long, lamellar, corrugate and somewhat curved; nacre salmon colored or purplish and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 156.



28 *Unio Tellicoensis.*
29 *Unio Yadkinensis.*
30 *Unio Conasaugaensis.*

T. Sinclair & Son, lith, Phila.

Hab.—Yadkin River, near Salisbury, North Carolina, C. M. Wheatley, Esq.

My cabinet, and cabinets of Mr. Wheatley and Dr. Hartman.

Diam. 1·1, Length 1·9, Breadth 3 inches.

Shell smooth, oblong, compressed, very inequilateral, flattened at the sides, subbiangular behind, rounded before; substance of the shell thick, very slightly thicker before; ligament rather large and dark brown; epidermis dark brown, without rays, slightly sulcate before and rugose behind, with very distant marks of growth; umbonial slope very obtusely angular; posterior slope carinate, narrow elliptical; cardinal teeth rather small, compressed, crenulate, corrugate and double in both valves; lateral teeth long, lamellar, corrugate and somewhat curved; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, very large and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; ventral cicatrices very small; cavity of the shell rather shallow and wide; cavity of the beaks very shallow and rounded; nacre salmon colored or purplish and very iridescent.

Remarks.—Mr. Wheatley received quite a number of this species from the Yadkin River, and I owe to him a fine suite of them. It is of the *complanatus* group, but is not so wide as *complanatus*, and is higher on the umbonial slope. It differs from *planilateris* Con. from the same river in being less wide and having a very different epidermis. It is very near to *quadrilateris* and *humerosus* (nobis), but is less quadrate than the former and not so long as the latter. The remarkable character of possessing a ventral muscular attachment, leaving a small cicatrix, is worthy of notice. All the specimens before me have it more or less developed. The nacre of these specimens is salmon more or less deeply colored, except one, which is pale purplish. None of them have a white nacre. The beaks, being much eroded, present only the remains of undulations at the tips, very like those of *complanatus*.

UNIO CONASAUGAENSIS. Pl. 10, fig. 30.

Testa lævi, suboblonga, subinflata, inæquilaterali, postice subbiangulata, antice rotundata; valvulis percrassis, antice crassioribus; natibus subprominentibus; epidermide rufo-fusca, eradiata; dentibus cardinalibus parviusculis, subcompressis crenulatisque; lateralibus curtis, crassis, obliquis rectisque; margarita alba et aliquanto iridescente.

Shell smooth, rather oblong, somewhat inflated, inequilateral, subbiangular behind and rounded before; valves very thick, thicker before; beaks somewhat prominent; epidermis reddish-brown and without rays; cardinal teeth rather small, somewhat compressed and crenulate; lateral teeth short, thick, oblique and straight; nacre white and somewhat iridescent.

Proc. Acad. Nat. Sci., 1872, p. 155.

Hab.—Conasauga Creek, Monroe Co., East Tennessee, Miss A. E. Law.

My cabinet.

Diam. 1·1, Length 1·6, Breadth 2·5 inches.

Shell smooth, rather oblong, somewhat inflated, inequilateral, subbiangular behind, rounded before; substance of the shell thick, thicker before; beaks somewhat prominent; ligament large and dark brown; epidermis reddish-brown, roughened towards the margin, rayless, with rather close marks of growth; umbonial slope rounded; posterior slope narrow elliptical, with obscure indented lines; cardinal teeth rather small, somewhat compressed and crenulate, slightly disposed to be treble in the right valve; lateral teeth short, thick, oblique and straight; anterior cicatrices distinct, rather large and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed on the upper side of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks somewhat deep and obtusely angular; nacre white and somewhat iridescent.

Remarks.—Among a number of *Uniones* from East Tennessee a single specimen of this species was sent by Miss Law to Dr. Lewis. In outline it is very near to *subflavus* (nobis), but it is a stouter, more inflated species, may easily be distinguished by its having a rougher epidermis, more close marks of growth, and in being darker in the epidermis. The teeth also differ, being much smaller and thinner in *subflavus*. The beaks being eroded in the specimen under examination, the undulations cannot be described.

UNIO CONSPICUUS. Pl. 11, fig. 31.

Testa lævi, elliptica, subinflata, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassis, antice crassioribus; natibus prominulis, ad apices undulatis; epidermide rufo-fusca, perradiata; dentibus cardinalibus parviusculis, crenulatis, compresso-conicis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis, parum curvatis; margarita conspicua, persalmonia et formoso-iridescente.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely angular behind and rounded before; valves thick, thicker before; beaks somewhat prominent, undulate at the tips; epidermis reddish-brown, radiate all over the disk; cardinal teeth rather small, crenulate, compressed conical, double in both valves; lateral teeth very long, lamellar and somewhat curved; nacre very bright, deep salmon colored and beautifully iridescent.

Proc. Acad. Nat. Sci., 1872, p. 156.

Hab.—Yadkin River, near Salisbury, North Carolina, C. W. Wheatley.

My cabinet and cabinets of C. M. Wheatley and Dr. Hartman.

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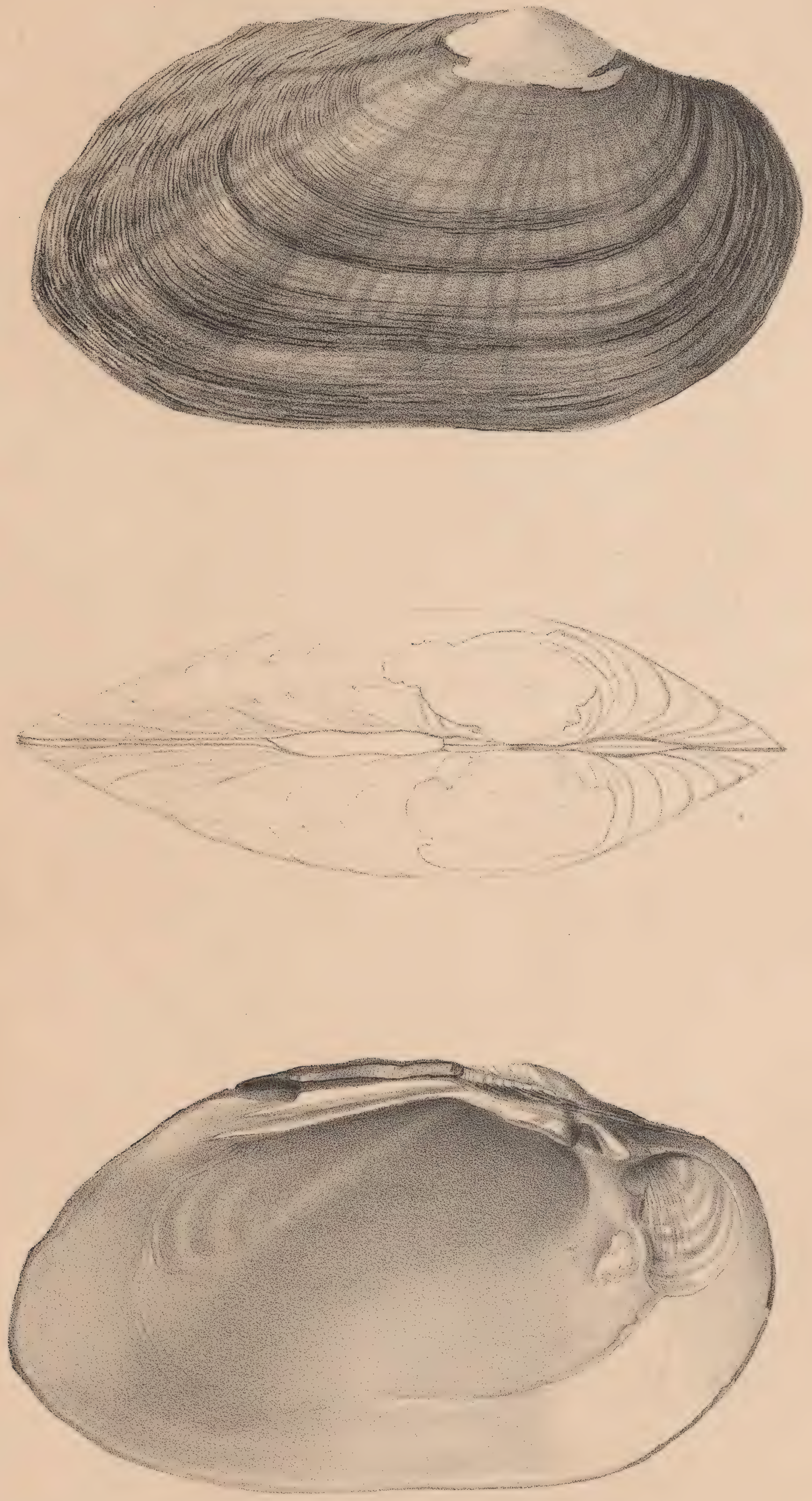


31 *Unio conspicuus.*

T. Sinclair & Son, lith, Phila.

Diam. 1·5, Length 2·5, Breadth 4·3 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely angular behind and rounded before; substance of the shell thick, thicker before; beaks somewhat prominent, undulate at the tips; ligament large and dark brown; epidermis reddish-brown, radiated all over the disks and with distant marks of growth; umbonial slope obtusely angular; posterior slope narrow elliptical, rough and dark in the adult; cardinal teeth rather small, crenulate, compressed conical and double in both valves; lateral teeth very long, lamellar and somewhat curved; anterior cicatrices distinct, very large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed within the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rather shallow and obtusely angular; nacre very bright, deep salmon colored and beautifully iridescent.

Remarks.—This is another fine species obtained from North Carolina by Mr. Wheatley, to whom I am indebted for a fine suite. It is closely allied to *radiatus* Lam. Like it the rays are fine and usually cover the whole disk. The outline is very nearly the same. It is rather more inflated than the *radiatus* of the Delaware, Schuylkill and Susquehanna Rivers. It differs in the cardinal teeth being more compressed. The color of the nacre of all the specimens I have seen is of a very beautiful salmon. In some this color is intense.

UNIO BREVIS. Pl. 12, fig. 32.

Testa lævi, subtriangulari, subcompressa, ad latere subplanulata, inæquilaterali, postice obtuse biangulata, antice rotundata; valvulis crassiusculis, antice crassioribus; natibus prominulis; epidermide flavida, eradiata; dentibus cardinalibus parviusculis, subcompressis, in utroque valvulo duplicibus; lateralibus lamellatis, parviusculis obliquisque; margarita vel alba vel salmonis colore tincta et valde iridescente.

Shell smooth, subtriangular, somewhat compressed, flattish at the sides, inequilateral, obtusely biangular behind, rounded before; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis yellowish and without rays; cardinal teeth rather small, subcompressed and double in both valves; lateral teeth rather small and oblique; nacre white or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 157.

Hab.—Conasauga Creek, Monroe Co., East Tennessee, Miss Law.

My cabinet and cabinets of Dr. Lewis and C. M. Wheatley.

Diam. ·6, Length 1·3, Breadth 1·9 inch.

Shell smooth, subtriangular, somewhat compressed, flattened at the sides, inequilateral, obtusely biangular behind, rounded before; substance of the shell somewhat thick, thicker before; beaks somewhat prominent; ligament rather short, thick and dark brown; epidermis yellowish, without rays, with somewhat distant marks of growth; umbonial slope very obtusely biangular; posterior slope carinate, narrow elliptical, with an obscurely impressed line from the beaks to the posterior margin; cardinal teeth rather small, subcompressed and double in both valves; lateral teeth rather small and oblique; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices distinct, rather large and well impressed; dorsal cicatrices placed above the centre; cavity of the shell shallow; cavity of the beaks obtusely angular and somewhat deep; nacre white or tinted with salmon color and very iridescent.

Remarks.—Two specimens were received by me from Dr. Lewis and Mr. Wheatley. Neither of the shells was perfect at the beaks. The character of the undulations of the tips is therefore unknown. In outline it is between *gibber* (nobis) and *rubiginosus* (nobis). Along the inferior margin the epidermis is somewhat rough and imbricate. One of the specimens before me has a few obsolete rays.

UNIO ANDERSONENSIS. Pl. 12, fig. 33.

Testa lævi, triangulari, inflata, ad latere planulata, emarginata, valde inæquilaterali, postice obtuse angulata, antice oblique rotundata; valvulis percrassis, antice crassioribus; natibus valde elevatis, tumidis recurvatisque; epidermide vel luteola vel fusca, obsolete radiata; dentibus cardinalibus crassis, crenulatis, conicis; lateralibus crassis, curtis subcurvisque; margarita argentea et iridescente.

Shell smooth, triangular, inflated, flattened at the sides, emarginate, very inequilateral, obtusely angular behind, obliquely rounded before; valves very thick, thicker before; beaks very much raised, swollen and recurved; epidermis yellowish or brownish, obscurely rayed; cardinal teeth thick, crenulate, conical; lateral teeth thick, short and somewhat curved; nacre silver white and iridescent.

Proc. Acad. Nat. Sci., 1872, p. 155.

Hab.—Holston River; and Clinch River, Anderson Co., East Tennessee, Miss A. E. Law.

My cabinet, and cabinet of Dr. Lewis.

Diam. 1·4, Length 1·7, Breadth 1·6 inch.

Shell smooth, triangular, inflated, flattened at sides, emarginate, very inequilateral, obtusely angular behind, obliquely rounded before; substance of the shell very thick, thicker before; beaks very much raised, swollen and recurved; ligament short, thick and chestnut brown; epidermis yellowish or brownish, obscurely rayed, with rather close marks of growth; umbonial slope obtusely angular; posterior slope cordate; cardinal teeth thick, crenulate, conical; lateral teeth very thick, short, somewhat curved and corrugate; anterior cicatrices distinct, rather small and deeply impressed; posterior cicatrices very distinct and deeply impressed; dorsal cicatrices placed on the upper side of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks deep and obtusely angular; nacre silver-white and iridescent.

Remarks.—Among the specimens sent last season by Miss Law to Dr. Lewis was a single specimen, large for the species and well developed, but with beaks much eroded. During the present year (1871) Miss Law sent from Clinch River four other specimens, smaller but in better condition. The youngest is not quite one-third grown and has a bright polished, yellow epidermis nearly covered with delicate green rays; in this respect resembling *Edgarianus* (nobis). The three specimens of intermediate age are nearly of one size, have dark epidermis with a few very obscure rays on the umbones. The sides of the valves are so impressed as nearly to make a wide furrow, and this indenture causes the emargination of the basal margin. This species emphatically belongs to the *Edgarianus* group, but may be distinguished by its being more inflated, less rayed, and in having a less polished surface in the adults than *Edgarianus.* The specimen figured is the largest of the five.

UNIO VESICULARIS. Pl. 12, fig. 34.

Testa lævi, elliptica, inflata, valde inæquilaterali, postice et antice rotundata; valvulis crassiusculis, antice crassioribus; natibus prominulis; epidermide tenebroso-oliva, obsolete radiata; dentibus cardinalibus parvis, sulcatis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis subrectisque; margarita albida et valde iridescente.

Shell smooth, elliptical, inflated, very inequilateral, rounded behind and before; valves a little thick, thicker before; beaks slightly prominent; epidermis dark olive, obscurely rayed; cardinal teeth small, sulcate and double in both valves; lateral teeth rather long, lamellar and nearly straight; nacre whitish and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 156.

Hab.—Lake Ocheechobee, Florida, Dr. Budd and C. M. Wheatley.

My cabinet, and cabinet of Mr. Wheatley.

Diam. ·5, Length ·7, Breadth 1·3 inch.

Shell smooth, elliptical, inflated, very inequilateral, rounded behind and before; substance of the shell a little thick, thicker before; beaks slightly prominent; ligament rather long and thin; epidermis dark olive, obscurely rayed, with distant marks of growth; umbonial slope rounded; posterior slope narrow-elliptical; cardinal teeth small, sulcate, somewhat compressed and double in both valves; lateral teeth rather long, lamellar and nearly straight; anterior cicatrices distinct, small and well impressed; posterior cicatrices confluent, rather large and moderately impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and obtusely angular; nacre whitish, rich and very iridescent.

Remarks.—Many years since I received from the late Dr. Budd of New York two opposing not well matched valves of this Unio. Both valves evidently belonged to females and both were much eroded. Not being entirely satisfied from imperfect odd valves that they belonged to an undescribed species, I placed them aside in the hope of getting others from Florida like them. The provided name *vesicularis* was placed on the label. Now after about twenty years my friend C. M. Wheatley, of Phœnixville, sends me a single smaller specimen from Lake Ocheechobee, which is evidently a male. The description and figure are made from this more perfect specimen. In outline it is very much the same with *parvus* Bar., but it is not so thick a species and the epidermis is lighter colored and is rayed. Neither of the specimens is perfect enough to exhibit the undulations of the beaks, which is much to be regretted, as this character might give us with certainty the key to the group in which it belongs.

UNIO CURVATUS. Pl. 13, fig. 35.

Testa lævi, late oblonga, subinflata, ad latere planulata, valde inæquilaterali, postice angulata, antice rotundata; valvulis parum crassis, antice crassioribus; natibus prominulis; epidermide tenebroso-fusca, aliquanto polita, eradiata; dentibus cardinalibus parvis, sulcatis, compressis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margarita pallido salmonia vel purpurascente et valde iridescente.

Shell smooth, widely oblong, somewhat inflated, flattened at the sides, very inequilateral, angular behind, rounded before; valves somewhat thick, thicker before; beaks a little prominent; epidermis dark brown, somewhat polished, without rays; cardinal teeth small, sulcate, compressed, double in both valves; lateral teeth long, lamellar and nearly straight; nacre pale salmon color or purple and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 159.

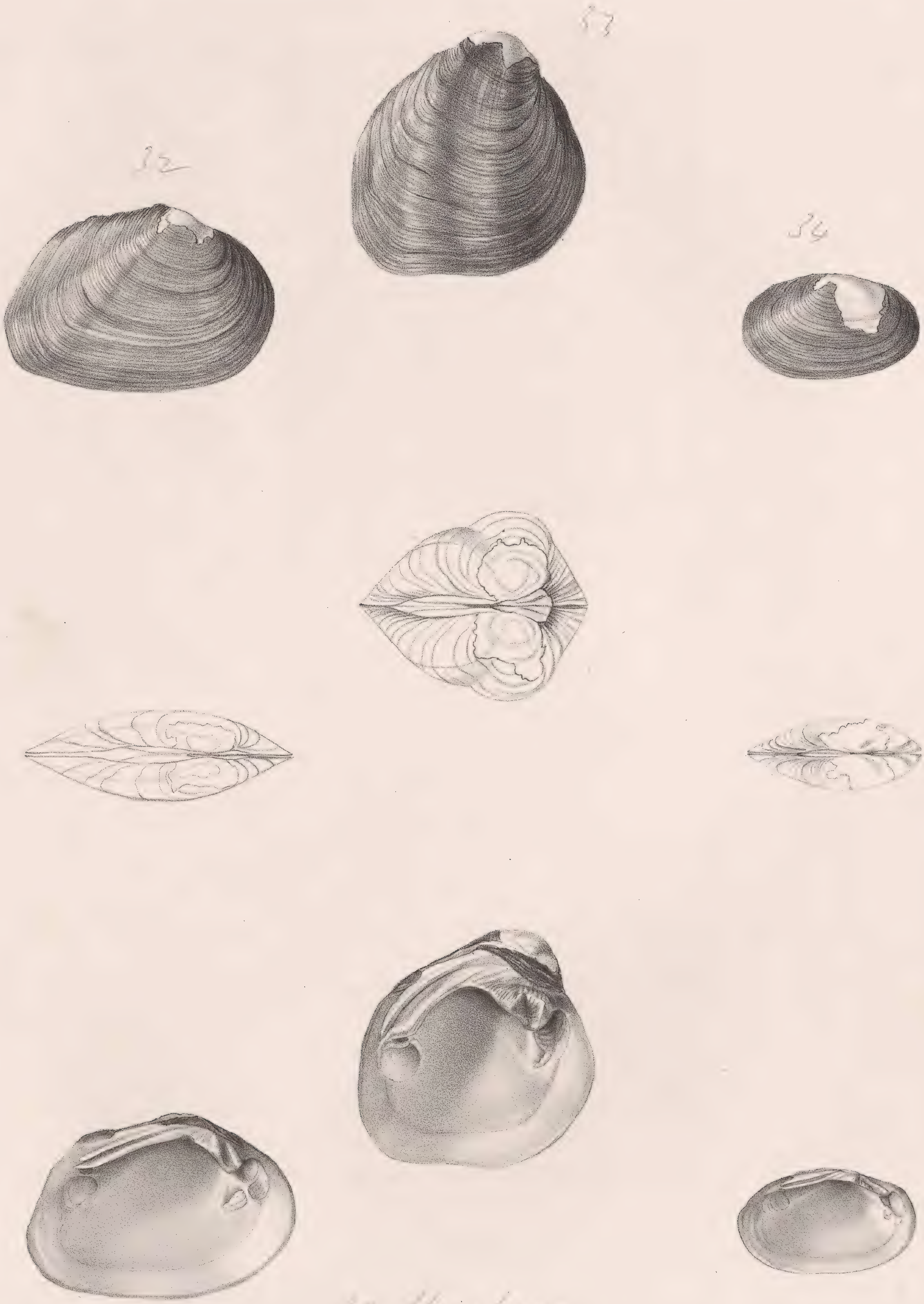
Hab.—Pfeiffer's Pond, Mecklenberg Co., North Carolina, C. M. Wheatley.

My cabinet, and cabinet of C. M. Wheatley.

Diam. ·7, Length 1·1, Breadth 2·4 inches.

Shell smooth, widely oblong, somewhat inflated, flattened on the sides, very inequilateral, angular behind, rounded before; substance of the shell somewhat thick, thicker before; beaks a little prominent, placed towards the anterior end; ligament long, thin and brown; epidermis dark brown, somewhat polished, without rays, with two or three distant marks of growth well developed; umbonial slope obtusely angular; posterior slope subcarinate, narrow elliptical; cardinal teeth small, sul-

pl 12



32 Unio brevis.
33 Unio Andersonensis
34 Unio vesicularis.

cate, compressed, double in both valves; lateral teeth long, lamellar and nearly straight; anterior cicatrices distinct, large and well impressed; posterior cicatrices distinct, large and slightly impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell wide and very shallow; cavity of the beaks shallow and obtusely angular; nacre pale salmon color or purple and very iridescent.

Remarks.—Three specimens are before me by Mr. Wheatley's kindness. This species is allied to *virens* and *Catawbensis* (nobis), more so in outline to the latter, but it is rather wider and not so large a shell. It is not quite so flat on the sides as *Catawbensis.* None of the specimens were perfect enough to display the character of the undulations of the tips of the beaks.

UNIO AMPLUS. Pl. 13, fig. 36.

Testa lævi, oblonga, fere alata, inflata, inæquilaterali, postice obtuse biangulata, antice rotundata; valvulis crassis, antice crassioribus; natibus subprominentibus; epidermide rufo-fusca, nitida, obsolete radiata, transverse vittata; dentibus cardinalibus parviusculis, rugosis, compressis; lateralibus prælongis lamellatisque; margarita vel alba vel purpurea vel salmonis colore tincta et valde iridescente.

Shell smooth, oblong, almost winged, inflated, inequilateral, obtusely biangular behind, rounded before; valves thick, thicker before; beaks somewhat prominent; epidermis reddish-brown, shining, obscurely radiate and transversely banded; cardinal teeth rather small, rugose and compressed; lateral teeth very long and lamellar; nacre white, purple or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 157.

Hab.—Irwin's Creek, Mecklenberg Co., North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. 1·3, Length 2, Breadth 3·6 inches.

Shell smooth, oblong, almost winged, inflated, inequilateral, obtusely biangular behind, rounded before; substance of the shell thick, thicker before; beaks somewhat prominent; ligament rather long and somewhat thin; epidermis reddish-brown, shining, obscurely radiate and transversely banded, with rather distant marks of growth; umbonial slope obtusely angular; posterior slope carinate, elliptical, almost winged, with two slightly impressed lines from the beaks to the margin; cardinal teeth rather small, rugose and compressed; lateral teeth very long and lamellar; anterior cicatrices distinct, very large and well impressed; posterior cicatrices confluent, very large and moderately impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; nacre white, purple or salmon color.

Remarks.—Among the North Carolina shells sent to me by Mr. Wheatley, were four of this species. The largest of these is figured. The lines of growth are well defined and on this specimen are five in number. It belongs to the group of *Raleighensis* (nobis), and may be placed between that species and *Abbevillensis.* It is larger than the latter and is higher in the wing than either. The beaks of all the specimens were too much eroded to give the character of the undulations of the tips.

UNIO INSOLIDUS. Pl. 13, fig. 37.

Testa lævi, oblonga, parum compressa, ad latere parum planulata, inæquilaterali, postice obtuse biangulari, antice rotundata; valvulis subtenuibus, antice parum crassioribus; natibus subprominentibus, ad apices undulatis; epidermide pallido-viridi, obsolete radiata; dentibus cardinalibus parvis, compressis; lateralibus longis, lamellatis rectisque; margarita alba et iridescente.

Shell smooth, oblong, somewhat compressed, slightly flattened at the sides, inequilateral, obtusely biangular behind, rounded before; valves rather thin, rather thicker before; beaks somewhat prominent, undulate at the tips; epidermis pale green, obscurely radiate; cardinal teeth small, compressed; lateral teeth long, lamellar and straight; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1872, p. 159.

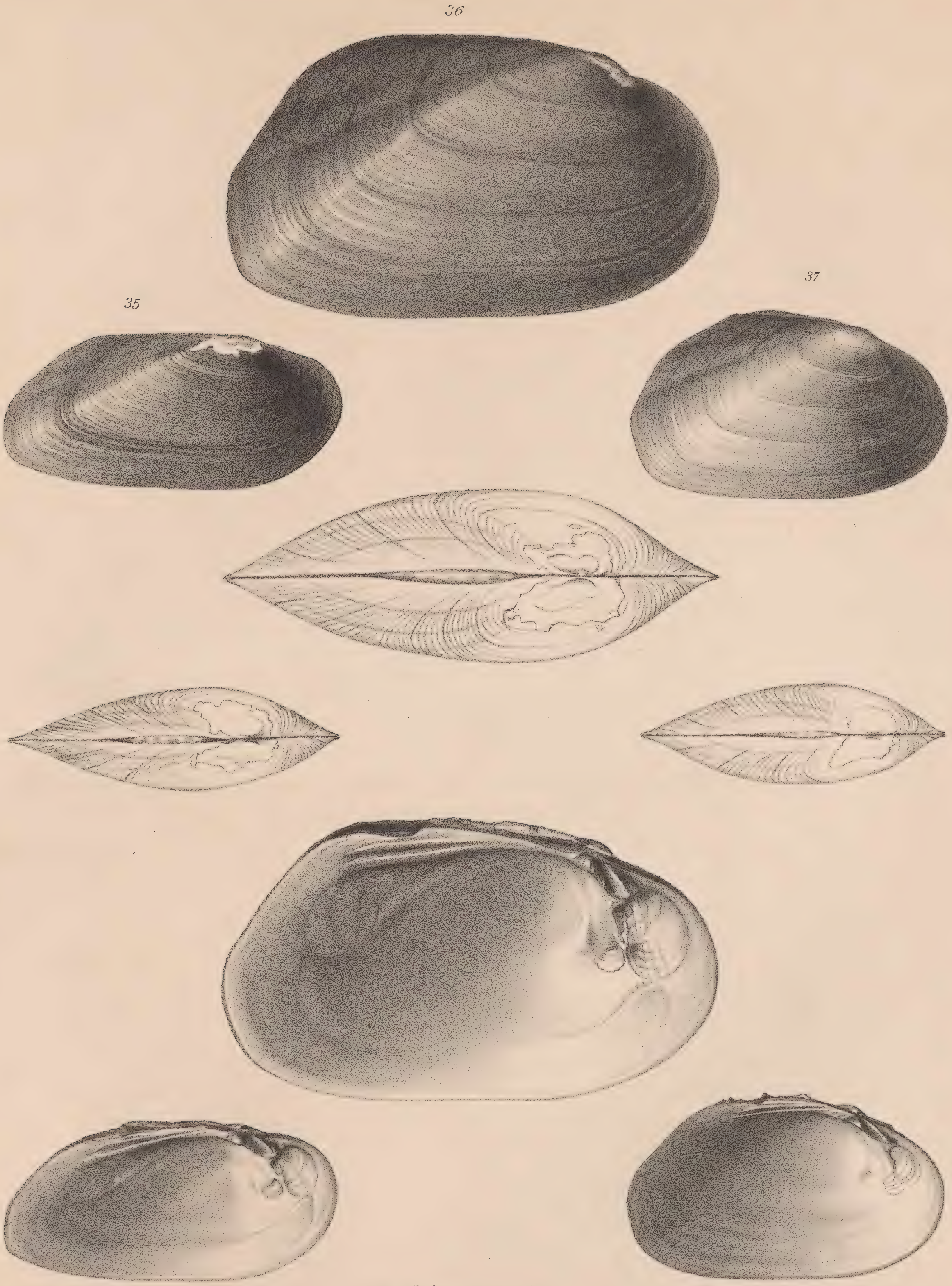
Hab.—Abbeville Dist., So. Car., Dr. Barratt; Fredericksburg, Va., Dr. Emmons; Irwin's Creek, Mecklenberg Co., North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. ·7, Length 1·3, Breadth 2·3 inches.

Shell smooth, oblong, somewhat compressed, slightly flattened on the sides, inequilateral, obtusely biangular behind, rounded before; substance of the shell rather thin, thicker before; beaks somewhat prominent, undulate at the tips; ligament long, thin and light brown; epidermis pale green, obscurely radiate and with rather distant marks of growth; umbonial slope rounded; posterior slope carinate, narrow-elliptical, almost winged, with two green lines from the beaks to the margin; cardinal teeth small and compressed; lateral teeth long, lamellar and straight; anterior cicatrices confluent, rather large and very slightly impressed; posterior cicatrices confluent and scarcely perceptible; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and obtusely angular; nacre white and iridescent.

Remarks.—I have had three specimens of this shell many years from Dr. Barratt of Abbeville District, S. C. This species is so near to *U. decoratus* (nobis) in many characters, that I thought it might be merely a well-marked variety of that species. Having about thirty specimens from Mr. Wheatley taken in a more northern habitat of a different State, I do not hesitate to consider it distinct. It differs from *decoratus* in being more oblong and in having rather larger teeth.



35 *Unio curvatus.*
36 *Unio amplus.*
37 *Unio insolidus.*

T. Sinclair & Son, lith. Phila.

The specimen from Virginia seems to be a male, while the others are generally females, judging from the enlargement of the umbonial slope.

UNIO ATTENUATUS. Pl. 14, fig. 38.

Testa lævi, lata, attenuata, ad latere subcompressa, valde inæquilaterali, postice subbiangulari, antice oblique rotundata; valvulis crassiusculis, antice parum crassioribus; natibus prominulis, fere terminalibus; epidermide tenebroso-fusca, aliquanto nigra, radiata; dentibus cardinalibus parvis, compressis, crenulatis, obliquis, in utroque valvulo-duplicibus; lateralibus prælongis, lamellatis subrectisque; margarita alba et valde iridescente.

Shell smooth, wide, attenuate, somewhat compressed at the sides, very inequilateral, subbiangular behind and obliquely rounder before; valves somewhat thick, slightly thicker before; beaks slightly prominent, nearly terminal; epidermis dark brown, somewhat blackish, radiated; cardinal teeth small, compressed, crenulate, oblique, double in both valves; lateral teeth very long, lamellar and nearly straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 157.

Hab.—Savannah River, Geo., Dr. Barratt; and Beaver Creek, Houston Co., Geo., J. Lewis, M.D.

My cabinet and cabinet of Dr. Lewis.

Diam. ·7, Length 1, Breadth 2·7 inches.

Shell smooth, wide, attenuate, somewhat compressed at the sides, very inequilateral, almost terminal, subbiangular behind and obliquely rounded before; substance of the shell somewhat thick, slightly thicker before; beaks slightly prominent; ligament long, thin and brown; epidermis dark brown, somewhat blackish, radiated, with very distant marks of growth; umbonial slope obtusely angular; posterior slope subcarinate, narrow elliptical; cardinal teeth small, compressed, crenulate, oblique, double in both valves; lateral teeth very long, lamellar, nearly straight; anterior cicatrices distinct, somewhat large and moderately impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell wide and subcylindrical; cavity of the beaks shallow and obtusely angular; nacre white and very iridescent.

Remarks.—There are five specimens before me. That which is figured is from Beaver Creek, Geo. It is the most perfect and the whole disk is covered with small dark green rays. The old specimens are quite black and without rays. The nacre in all these is white and finely iridescent. None were perfect enough in the beaks to display undulations at the tips. It is very near in outline to *rostriformis* and *Hazlehurstianus* (nobis).

UNIO DIFFERTUS. Pl. 14, fig. 39.

Testa lævi, suboblonga, ventricosa, subæquilaterali, postice obtuse biangulari, fere rotunda, antice rotundata; valvulis crassis, antice crassioribus; natibus vix prominulis; epidermide subpolita, luteola et obsolete radiata; dentibus cardinalibus parviusculis, corrugatis, compressis et in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margarita vel albida vel salmonis colore tincta et valde iridescente.

Shell smooth, suboblong, ventricose, subequilateral, obtusely biangular behind, almost round, rounded before; valves thick, thicker before; beaks scarcely prominent; epidermis somewhat polished, yellowish and obscurely radiated; cardinal teeth rather small, corrugate, compressed and double in both valves; lateral teeth long, lamellar and nearly straight; nacre salmon colored or white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 158.

Hab.—Georgia? Major J. Le Conte.

My cabinet and cabinet of the Academy Natural Sciences.

Diam. 1·3, Length 1·7, Breadth 3·2 inches.

Shell smooth, elliptical, ventricose, subequilateral, obtusely biangular behind, almost round, rounded before; substance of the shell thick, thicker before; beaks scarcely prominent; ligament rather short and thick; epidermis somewhat polished, yellowish and obscurely radiated; umbonial slope rounded; posterior slope widely elliptical, subcarinate, with several impressed lines from the beaks to the margin; cardinal teeth rather small, corrugate, compressed and double in both valves; lateral teeth long, lamellar, nearly straight and enlarged at the posterior end; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and moderately impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks shallow and rounded; nacre light salmon colored or white and very iridescent.

Remarks.—Two specimens are before me. That which is figured is more inflated than the other and is probably a female. They came from the late Major Le Conte's collection, and although no habitat was attached to them, I have no doubt that they came from Georgia, as many of the new species given to me by him were from Liberty County of that State. The lines of growth are very distant. There are two specimens before me and these are moderately large and no doubt full grown. In outline *differtus* is near to *Savannahensis* (nobis), but differs in not having the side flattened and having a rounded umbonial slope. It is also near to *Cuvierianus* (nobis), but is not quite so oblique. One of the specimens, although eroded, shows imperfect undulations of the tips.

UNIO CUSPIDATUS. Pl. 14, fig. 40.

Testa lævi, lata, subinflata, ad latere parum curvata, valde inæquilaterali, postice cuspidata, subbiangulari, antice rotundata; valvulis crassiusculis; natibus prominulis, fere terminalibus; epidermide tenebroso-olivacea, eradiata, transverse vittata et polita; dentibus cardinalibus parvis, subcompressis, corrugatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margarita alba et valde iridescente.

Shell smooth, wide, somewhat inflated, somewhat curved at the side, very inequilateral, pointed behind, subbiangular, rounded before; beaks somewhat prominent, nearly terminal; epidermis dark olive, without rays, transverely banded and polished; cardinal teeth small, somewhat compressed, rough, double in both valves; lateral teeth long, lamellar and nearly straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 159.

Hab.—Buckhead Creek, Burke Co., Geo., Bishop Elliott; and Abbeville Dist., South Carolina, Dr. Barratt.

My cabinet.

Diam. ·7, Length 1·3, Breadth 2·7 inches.

Shell smooth, wide, somewhat inflated, somewhat curved at the side, very inequilateral, pointed and subbiangular behind, rounded before; beaks somewhat prominent and nearly terminal; ligament long, thin and light brown; epidermis dark olive, without rays, transversely banded, with rather close lines of growth and shining; umbonial slope rounded; posterior slope slightly carinate, narrow elliptical; cardinal teeth small, somewhat compressed, rough and double in both valves; lateral teeth long, lamellar and nearly straight; anterior cicatrices distinct, rather large and somewhat impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre white and very iridescent.

Remarks.—Some years since, among the many new and fine species sent to me by the late Bishop Elliott, were two of the above described species, one of which is only half grown. The description was delayed in hopes of getting more specimens, which I had failed to do until two half-grown specimens came from Dr. Barratt. In outline it is near to *Barrattii* (nobis) and approaches that of *Burkensis* (nobis). It differs from the former in having a less pronounced umbonial slope, in having a thinner shell, less greenish and in being polished; also, in being rayless. In the color and polish of the epidermis it is like *Burkensis*, but it is wider in proportion, rather more inflated and more pronounced in the umbonial slope. It has also some resemblance to *naviculoides* (nobis). The lines of growth are rather close and well defined. The beaks are too much eroded in these specimens to display any character.

UNIO ROSTELLUM. Pl. 15, fig. 41.

Testa lævi, lata, compressa, ad latere planulata, valde inæquilaterali, postice obtuse biangulari, antice rotunda; valvulis tenuibus; natibus parvis; epidermide tenebroso-fusca, obsolete radiata; dentibus cardinalibus compressis, crenulatis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis rectisque; margarita vel albida vel purpurea et valde iridescente.

Shell smooth, wide, compressed, flattened at the sides, very inequilateral, obtusely biangular behind, round before; valves thin; beaks small; epidermis dark brown, obscurely rayed; cardinal teeth compressed, crenulate, double in both valves; lateral teeth very long, lamellar and straight; nacre white or purple and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 160.

Hab.—Macon, Georgia, J. C. Plant.

My cabinet, and cabinets of Mr. Plant and Mr. Wheatley.

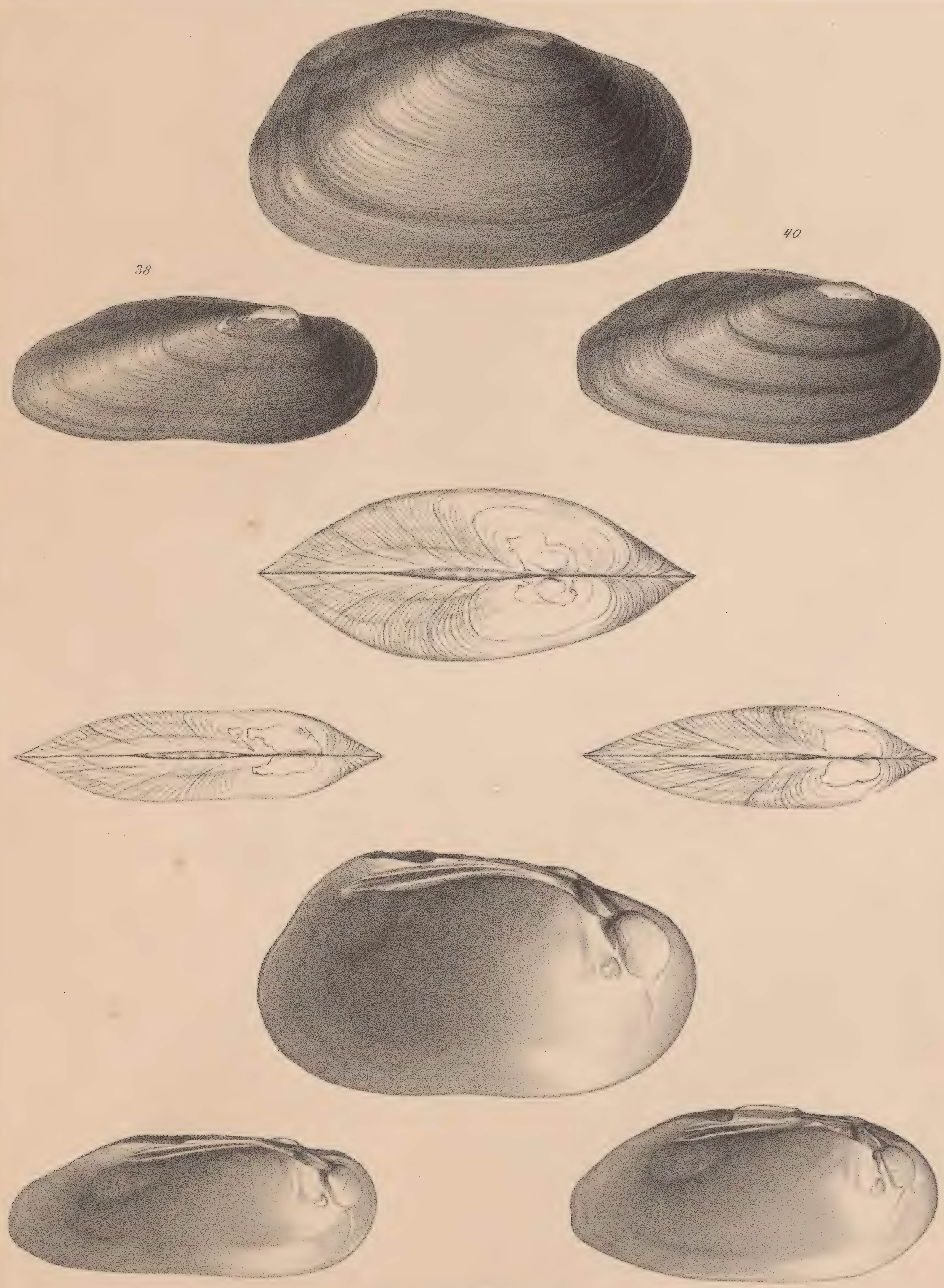
Diam. ·6, Length 1, Breadth 2·6 inches.

Shell smooth, wide, compressed, flattened at the sides, very inequilateral, obtusely biangular behind, round before; substance of the shell thin; beaks small; ligament rather long, thin and dark brown, obscurely rayed, with indistinct, rather distant marks of growth; umbonial slope obtusely angular; posterior slope slightly carinate, very much compressed, with impressed lines from the tips to the posterior margin; cardinal teeth compressed, crenulate, double in both valves; lateral teeth very long, lamellar and straight; anterior cicatrices distinct, large and slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks scarcely perceptible; nacre white or purple and very iridescent.

Remarks.—Half a dozen specimens are before me, all of which were received from Mr. Plant long since. I have delayed describing it in hopes of getting better specimens, but have not succeeded. This species is near *rostriformis* (nobis), but it is not quite so acute. It is a smaller species and more compressed. The figure is probably from a female. It is near to *exacutus* (nobis), but is smaller and less solid. The beaks of all the specimens are much eroded, but there are remains which indicate a number of small undulations at the tips.

UNIO IRWINENSIS. Pl. 15, fig. 42.

Testa lævi, suboblonga, parum compressa, ad latere parum planulata, valde inæquilaterali, postice obtuse biangulata, antice rotundata; valvulis subcrassis, antice crassioribus; natibus prominulis, ad apices undulatis; epidermide olivacea vel fusca, obsolete radiata; dentibus cardinalibus subgrandibus, parum compressis, sulcosis, in utroque valvulo duplicibus; lateralibus longis, sublamellatis subcurvisque; margarita alba vel purpurea vel salmonis colore tincta et valde iridescente.



38 *Unio attenuatus.*
39 *Unio differtus.*
40 *Unio cuspidatus.*

T. Sinclair & Son, lith. Phila.

Shell smooth, somewhat oblong, rather compressed, somewhat flattened at the sides, very inequilateral, obtusely biangular behind, rounded before; valves rather thick, thicker before; beaks slightly prominent, undulate at the tips; epidermis olivaceous or brown, obscurely rayed; cardinal teeth rather large, somewhat compressed, sulcose and double in both valves; lateral teeth long, somewhat lamellar and slightly curved; nacre white, purple or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 159.

Hab.—Irwin's Creek, North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. 1, Length 1·8, Breadth 3·1 inches.

Shell smooth, somewhat oblong, rather compressed, somewhat flattened at the sides, very inequilateral, obtusely biangular behind, rounded before; substance of the shell rather thick, thicker before; beaks slightly prominent, undulate at the tips; ligament rather short, thick and brown; epidermis olivaceous or brown, obscurely rayed, with distinct and somewhat close marks of growth; umbonial slope raised and obtusely angular; posterior slope carinate, narrow elliptical; cardinal teeth rather large, somewhat compressed, sulcose and double in both valves; lateral teeth long, somewhat lamellar and slightly curved; anterior cicatrices distinct and deeply impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell somewhat deep and wide; cavity of the beaks shallow; nacre white, purple or salmon colored and very iridescent.

Remarks.—Quite a number of specimens were sent to me by my friend Mr. Wheatley. In outline this species is near to *rufusculus* (nobis), but it is not so compact. Some specimens had ventral cicatrices and obscure rays. It reminds one of *Gastonensis* (nobis), but it is not so high in the wing.

UNIO EXACUTUS. Pl. 15, fig. 43.

Testa lævi, prælata, subcompressa, ad latere planulata, valde inæquilaterali, postice exacuta, subbiangulari, antice oblique rotundata; valvulis crassiusculis; natibus prominulis, fere terminalibus, ad apices minute undulatis; epidermide tenebroso-fusca, perradiata; dentibus cardinalibus parvis sulcatisque; lateralibus longis, rectis lamellatisque; margarita vel alba vel purpurea et valde iridescente.

Shell smooth, very wide, somewhat compressed, flattened at the sides, very inequilateral, pointed and subbiangular behind, obliquely rounded before; valves somewhat thick; beaks a little prominent, nearly terminal, minutely undulate at the tips; epidermis dark brown, very much rayed; cardinal teeth small and sulcate; lateral teeth long, straight and lamellar; nacre white or purple and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 159.

Hab.—Savannah River, at Governor Hamilton's, Geo., Dr. Barratt.

My cabinet.

Diam. ·7, Length 1, Breadth 3 inches.

Shell smooth, very wide, somewhat compressed, flattened at the sides, very inequilateral, pointed and subbiangular behind, obliquely rounded before; substance of the shell somewhat thick; beaks a little prominent, nearly terminal, minutely undulate at the tips; ligament long, thin and light brown; epidermis dark brown, very much rayed, with rather distant marks of growth; umbonial slope slightly raised and obtusely angular; posterior slope narrow-elliptical, subcarinate; cardinal teeth small, sulcate and disposed to be double in both valves; lateral teeth long, straight and lamellar; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks scarcely perceptible; nacre white or purple and very iridescent.

Remarks.—The odd valves of two adults and several complete young specimens are before me. It is a very wide species, allied to *folliculatus* (nobis). It is nearly of the same outline with *nasutus*, Say, but may be easily distinguished by its being a thicker, more robust shell, in being rather more compressed and in having more oblique rays.

UNIO SUBPARALLELUS. Pl. 16, fig. 44.

Testa lævi, oblonga, subcompressa, ad latere planulata, inæquilaterali, postice subbiangulari, antice rotundata; valvulis crassiusculis, antice parum crassioribus; natibus prominulis, ad apices concentrico-rugoso-undulatis; epidermide tenebroso-fusca, nitida, radiata; dentibus cardinalibus parviusculis, conicis, rugosis, in utroque valvulo subduplicibus; lateralibus prælongis, lamellatis subcurvisque; margarita salmonis colore tincta et valde iridescente.

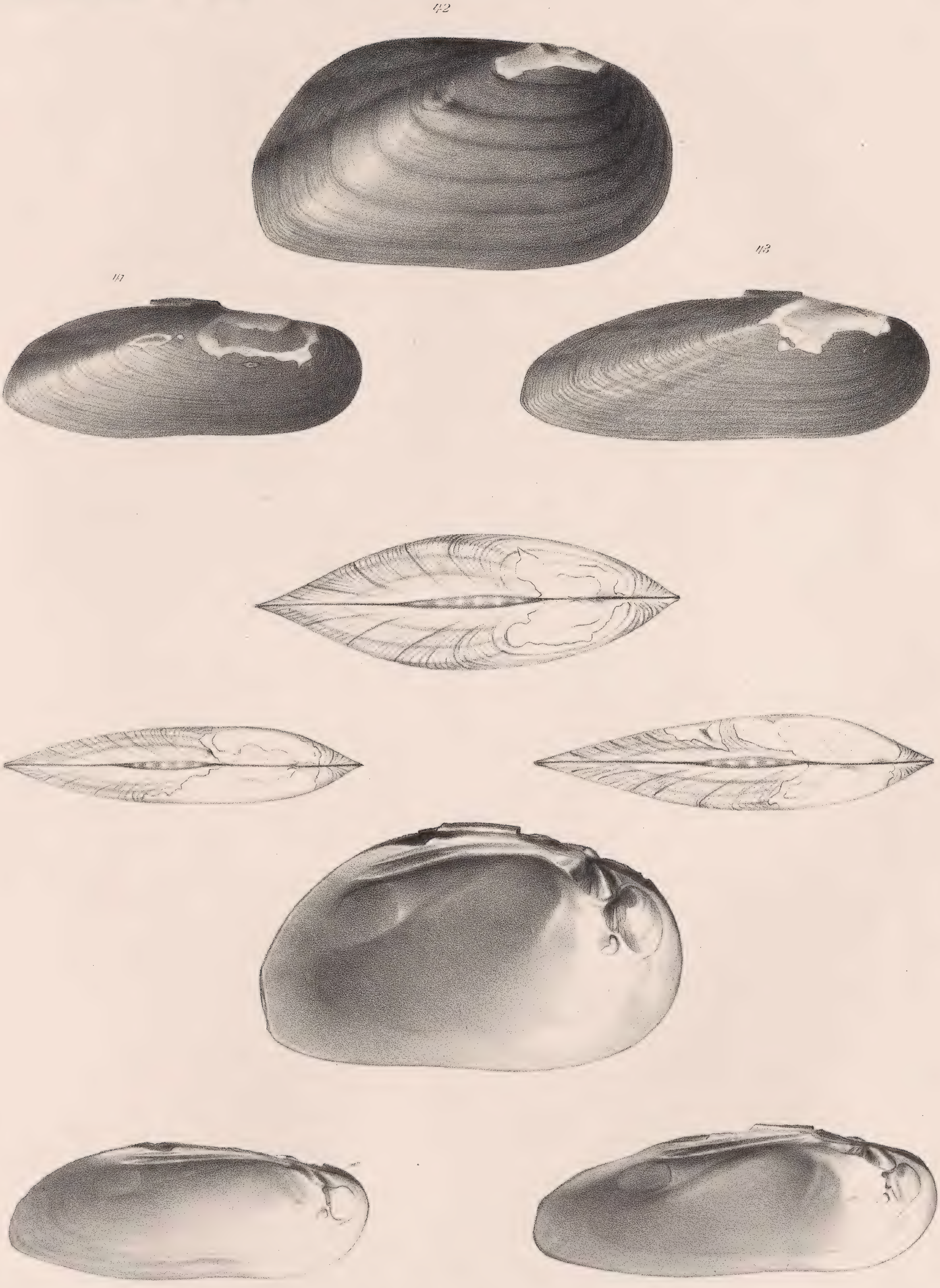
Shell smooth, oblong, somewhat compressed, flattened at the sides, inequilateral, subbiangular behind, rounded before; valves rather thick, slightly thicker before; beaks a little prominent, at the tips concentrically and roughly wrinkled; epidermis dark brown, shining and radiate; cardinal teeth rather small, conical, rugose and somewhat double in both valves; lateral teeth very long, lamellar and somewhat curved; nacre salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 158.

Hab.—Irwin's Creek and Fox River, North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. ·9, Length 1·4, Breadth 2·7 inches.



41 *Unio rostellum.*
42 *Unio Irwinensis.*
43 *Unio exacutus.*

T. Sinclair & Son, lith. Phila.

Shell smooth, oblong, somewhat compressed, flattened at the sides, inequilateral, subbiangular behind, rounded before; substance of the shell rather thick, slightly thicker before; beaks a little prominent, at the tips concentrically and roughly wrinkled; ligament rather large and dark brown; epidermis dark brown, shining and radiate; umbonial slope somewhat raised and obtusely angular; posterior slope carinate and rather narrow-elliptical; cardinal teeth rather small, conical, rugose and somewhat double in both valves; lateral teeth very long, lamellar and somewhat curved; anterior cicatrices distinct, large and rather deeply impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and rounded; nacre salmon colored and very iridescent.

Remarks.—I have four specimens before me. This species is nearly allied to *Catawbensis* and *rufusculus* (nobis). It is not so wide as the former, but is higher in the wing. All four are salmon colored. The old ones have no rays remaining; the younger are full of obscure rays. In outline it is near to *Irwinensis* described herein, but it is more compressed and has more distant marks of growth. It reminds one of *nubilus* (nobis) and is close to it in outline. None were perfect at the tips.

UNIO SUBSQUAMOSUS. Pl. 16, fig. 45.

Testa lævi, oblongo-elliptica, compressa, ad latere subplanulata, valde inæquilaterali, postice obtuse biangulari, antice oblique rotundata; valvulis crassiusculis; natibus parvis, prominulis, ad apices rugoso-undulatis; epidermide tenebroso-fusca, subsquamosa, eradiata; dentibus cardinalibus parvis, sulcatis, in utroquo valvulo duplicibus; lateralibus prælongis, lamellatis subrectisque; margarita alba et valde iridescente.

Shell smooth, oblong-elliptical, compressed, somewhat flattened at the sides, very inequilateral, obtusely biangular behind, obliquely rounded before; valves somewhat thick; beaks small, a little prominent, rugosely undulate at the tips; epidermis dark brown, somewhat squamose, without rays; cardinal teeth small, sulcate, double in both valves; lateral teeth very long, lamellar and nearly straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 160.

Hab.—Yadkin River, North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. ·8, Length 1·5, Breadth 3·1 inches.

Shell smooth, oblong-elliptical, compressed, somewhat flattened at the sides, very inequilateral, obtusely biangular behind, obliquely rounded before; substance of the shell somewhat thick; beaks small, a little prominent and rugosely undulate at the tips; ligament rather long, narrow and dark brown; epidermis dark brown, somewhat squamose, without rays, with distant and well-marked lines of growth; umbonial slope very slightly raised and obtusely angular; posterior slope slightly carinate and very narrow elliptical; cardinal teeth small, sulcate, compressed conical and double in both valves; lateral teeth very long, lamellar and nearly straight; anterior cicatrices distinct, very large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks scarcely observable; nacre white and very iridescent.

Remarks.—Mr. Wheatley has furnished me with seven specimens of this species. In outline it is nearest to *rostrum* (nobis). It is somewhat squamose like *squameus* (nobis), but it differs in outline and the beaks are more medial. There is a strong disposition to sulcation on the exterior, particularly on the anterior portion of the valve.

UNIO BASALIS. Pl. 16, fig. 46.

Testa lævi, oblonga, subinflata, ad latere subplanulata, inæquilaterali, postice obtuse biangulari, antice rotundata, ad basim recta; valvulis crassiusculis; natibus prominulis; epidermide luteola, radiata; dentibus cardinalibus parviusculis, subcompressis, sulcatis; lateralibus sublongis, lamellatis curvisque; margarita vel albida vel purpurascente et iridescente.

Shell smooth, oblong, somewhat inflated, flattened at the sides, inequilateral, obtusely biangular behind, rounded before, straight at the base; valves somewhat thick; beaks a little prominent; epidermis yellowish and radiate; cardinal teeth rather small, rather compressed, sulcate; lateral teeth rather long, lamellate and curved; nacre white or purple and iridescent.

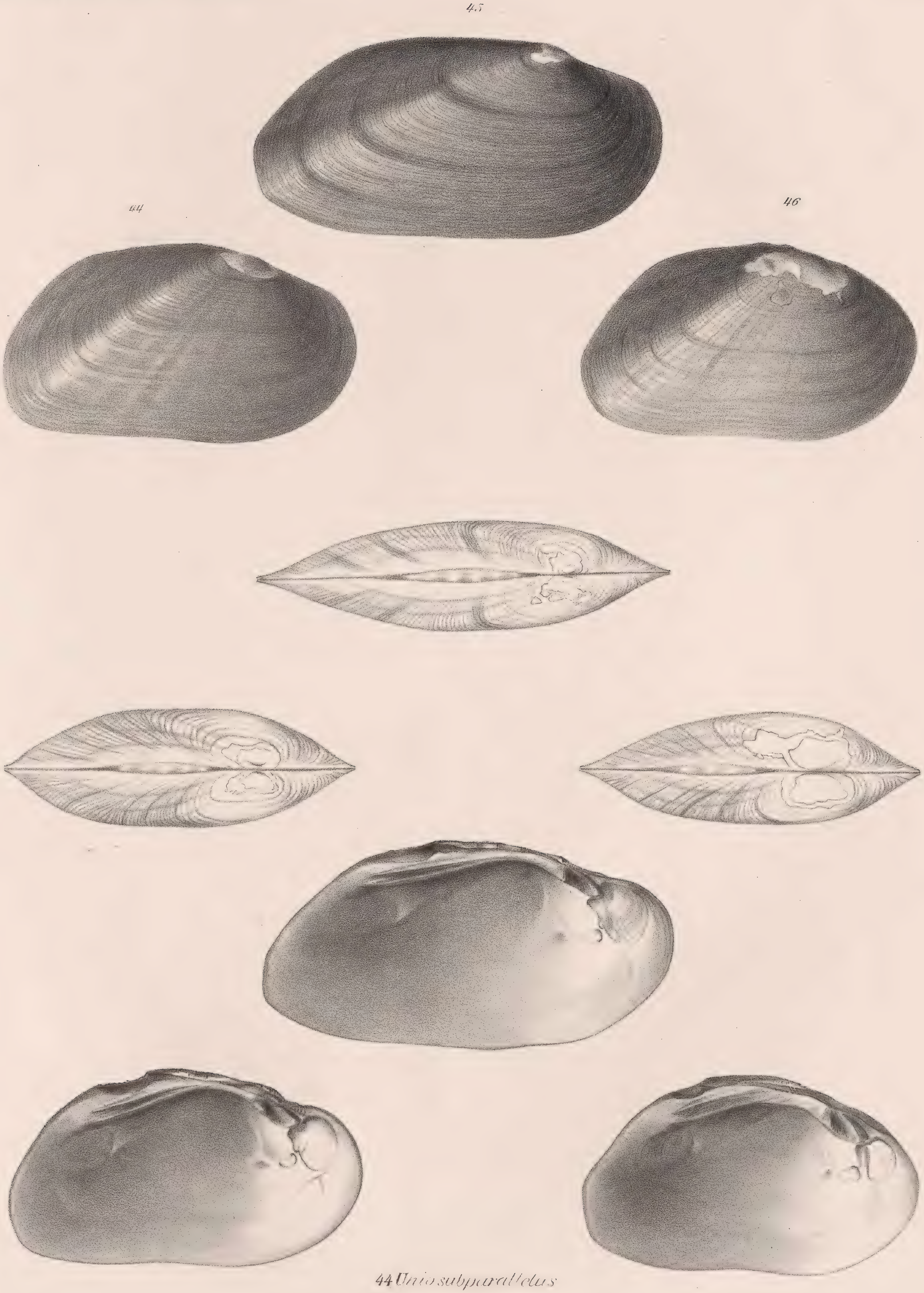
Proc. Acad. Nat. Sci., 1872, p. 161.

Hab.—Carter's Creek, near Columbus, Georgia, G. Hallenbeck.

My cabinet.

Diam. ·8, Length 1·5, Breadth 2·5 inches.

Shell smooth, oblong, somewhat inflated, flattened at the sides, inequilateral, obtusely biangular behind, rounded before, straight at the base; substance of the shell somewhat thick; beaks a little prominent; ligament short, thick and dark brown; epidermis yellowish, rayed, with rather close marks of growth; umbonial slope raised and rounded; posterior slope carinate, narrow elliptical; cardinal teeth rather small, somewhat compressed and sulcate; lateral teeth rather long, lamellar and curved; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, large and moderately well impressed; dorsal cicatrices placed



44 *Unio subparallelus.*
45 *Unio subsquamosus.*
46 *Unio basalis.*

P. S. Duval & Co. lith. Phila.

nearly in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks very small; nacre white or purple and very iridescent.

Remarks.—A single mature and several young specimens are before me. In outline it is near to *neglectus* (nobis), but it is more oblong and not ventricose. The tips of neither of the specimens are perfect enough to observe the character of the undulations. The specimen figured is evidently a female.

UNIO LIGATUS. Pl. 17, fig. 47.

Testa lævi, ovato-oblonga, subcompressa, inæquilaterali, postice obscure biangulari, antice rotundata; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fusca, polita, obsolete radiata, transverse vittata; dentibus cardinalibus parviusculis, corrugatis et in utroque valvulo duplicibus; lateralibus longis, lamellatis, corrugatis subcurvisque; margarita vel alba vel salmonis colore tincta et valde iridescente.

Shell smooth, ovately oblong, somewhat compressed, inequilateral, obscurely biangular behind, rounded before; valves rather thick; beaks rather prominent; epidermis dark brown, polished, obscurely radiate and transversely banded; cardinal teeth rather small, corrugate and double in both valves; lateral teeth long, lamellar, corrugate and somewhat curved; nacre white or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 157.

Hab.—Irwin's Creek, Mecklenburg Co., and Long Creek, Gaston Co., N. C., C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·8, Length 1·6, Breadth 2·8 inches.

Shell smooth, ovately oblong, somewhat compressed, inequilateral, obscurely biangular behind, rounded before; substance of the shell rather thick; beaks rather prominent; ligament rather long, thin and dark brown; epidermis dark brown, polished, obscurely radiate and transversely banded, with distant marks of growth; umbonial slope rounded; posterior slope subcarinate, narrow elliptical, with obscure impressed lines from the beaks to the posterior margin; cardinal teeth rather small, corrugate, crenulate and double in both valves; lateral teeth long, lamellar, corrugate and somewhat curved; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices small and placed above the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and curved; nacre white or salmon colored and very iridescent.

Remarks.—Specimens of this species were sent to me by Mr. Wheatley, to whom I am obliged for many new and interesting *Uniones* from North Carolina.

The well defined transverse bands of the marks of growth are more developed than usual, and the obscure capillary rays over the whole disk are unusual. The nacre is generally of a fine salmon color, sometimes it is white. None of the specimens before me are purplish, nor were they perfect enough to display the character of the tips of the beaks. This species belongs to the group of which *Abbevillensis* may be considered the type. That species has not the smooth polished epidermis which *ligatus* has.

UNIO BELLULUS. Pl. 17, fig. 48.

Testa lævi, obliqua, tumida, ad latere parum planulata, valde inæquilaterali, postice obtuse angulari, antice oblique rotundata; valvulis percrassis, antice crassioribus; natibus pyramidatis, fere terminalibus; epidermide luteola, valde radiata; dentibus cardinalibus subcrassis, rugosis; lateralibus curtis, crassis rugosisque; margarita argentea et valde iridescente.

Shell smooth, oblique, tumid, somewhat flattened at the side, very inequilateral, obtusely angular behind, obliquely rounded before; valves very thick, thicker before; beaks pyramidal, nearly terminal; epidermis yellowish, very much rayed; cardinal teeth rather thick and rugose; lateral teeth short, thick and rugose; nacre silver white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 161.

Hab.—Holston River, Dr. Edgar; Tennessee River, Rev. G. White; Mussel Shoals, Tennessee River, Alabama, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. ·9, Length 1·2, Breadth 1·3 inch.

Shell smooth, oblique, tumid, somewhat flattened at the sides, very inequilateral, obtusely angular behind, obliquely rounded before; substance of the shell very thick, thicker before; beaks pyramidal, nearly terminal; ligament short and light brown; epidermis yellowish, with broad interrupted green rays and somewhat distant marks of growth; umbonial slope rounded; posterior slope cordate, yellow, with two dotted rays from the beak to posterior margin in each valve; cardinal teeth rather thick and rugose; lateral teeth short, thick, rugose and very oblique; anterior cicatrices distinct, small and deeply impressed; posterior cicatrices distinct and well impressed; dorsal cicatrices placed nearly over the centre of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks deep and obtusely angular; nacre silver white and very iridescent.

Remarks.—Several specimens of different ages are before me. Some of middle age I have had for many years. The adult from Mr. Wheatley, recently received, satisfied me that the species was undescribed. The beautiful broad green interrupted rays nearly cover the whole disk. This species is nearly allied to *mundus* and *Lawii* (nobis), but is not so oblique as either. None of the specimens had the beaks perfect enough to present the character of the tips.

UNIO INFUSCUS. Pl. 17, fig. 49.

Testa lævi, elliptica, subinflata, inæquilaterali, postice obtuse biangulari, antice rotundata; valvulis crassis, antice crassioribus; natibus prominulis, ad apices parum undulatis; epidermide tenebroso-fusca, submicanti, obsolete radiata; dentibus cardinalibus subcrassis, compressis corrugatisque; lateralibus longis, lamellatis, rugosis subcurvisque; margarita vel salmonia vel purpurascente et valde iridescente.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely biangular behind, rounded before; valves thick, thicker before; beaks somewhat prominent, slightly undulate at the tips; epidermis dark brown, somewhat shining, obscurely radiate; cardinal teeth somewhat thick, compressed and corrugate; lateral teeth long, lamellar, rugose and somewhat curved; nacre salmon colored or purple and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 160.

Hab.—Fox River and Irwin's Creek, North Carolina, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. ·9, Length, 1·5, Breadth 2·8 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely biangular behind, rounded before; substance of the shell thick, thicker before; beaks somewhat prominent, slightly undulate at the tips; ligament rather large and dark brown; epidermis dark brown, somewhat shining, obscurely radiate, with very distant marks of growth; umbonial slope obtusely angular; posterior slope narrow-elliptical, carinate, with two indistinct impressed lines from beaks to margin; cardinal teeth somewhat thick, compressed and corrugate; lateral teeth long, lamellar, rugose and somewhat curved; anterior cicatrices distinct, large and well impressed; posterior cicatrices distinct, large and slightly impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and rounded; nacre salmon colored or purple and very iridescent.

Remarks.—Many specimens of various ages were received from Mr. Wheatley. The younger showed small undulations at the tips. The nacre generally salmon color, some of them quite brilliant; some were purplish, none white. The rays on the more perfect specimens are capillary; on the old specimens they are obsolete. This species is nearly allied to *ligatus* herein described, but it is more transverse, with more distant bands and is higher on the umbonial slope.

UNIO OBLONGUS. Pl. 18, fig. 50.

Testa lævi, oblonga, compressa, ad latere planulata, valde inæquilaterali; postice obtuse biangulari, antice rotundata; valvulis parum crassioribus; natibus prominulis; epidermide luteola, micanti, radiata vel eradiata; dentibus cardinalibus parvis, lobatis, corrugatis, in utroque valvulo duplicibus; lateralibus prælongis subrectisque; margarita alba vel purpurascenti vel salmonis colore tincta et iridescente.

Shell smooth, oblong, compressed, flattened at the sides, very inequilateral; obtusely biangular behind, rounded before; valves somewhat thick; beaks a little prominent; epidermis yellowish, shining, radiated or without rays; cardinal teeth small, lobed, corrugate, double in both valves; lateral teeth very long and straight; nacre white, purple or salmon color and iridescent.

Proc. Acad. Nat. Sci., 1872, p. 158.

Hab.—Irwin's Creek, North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

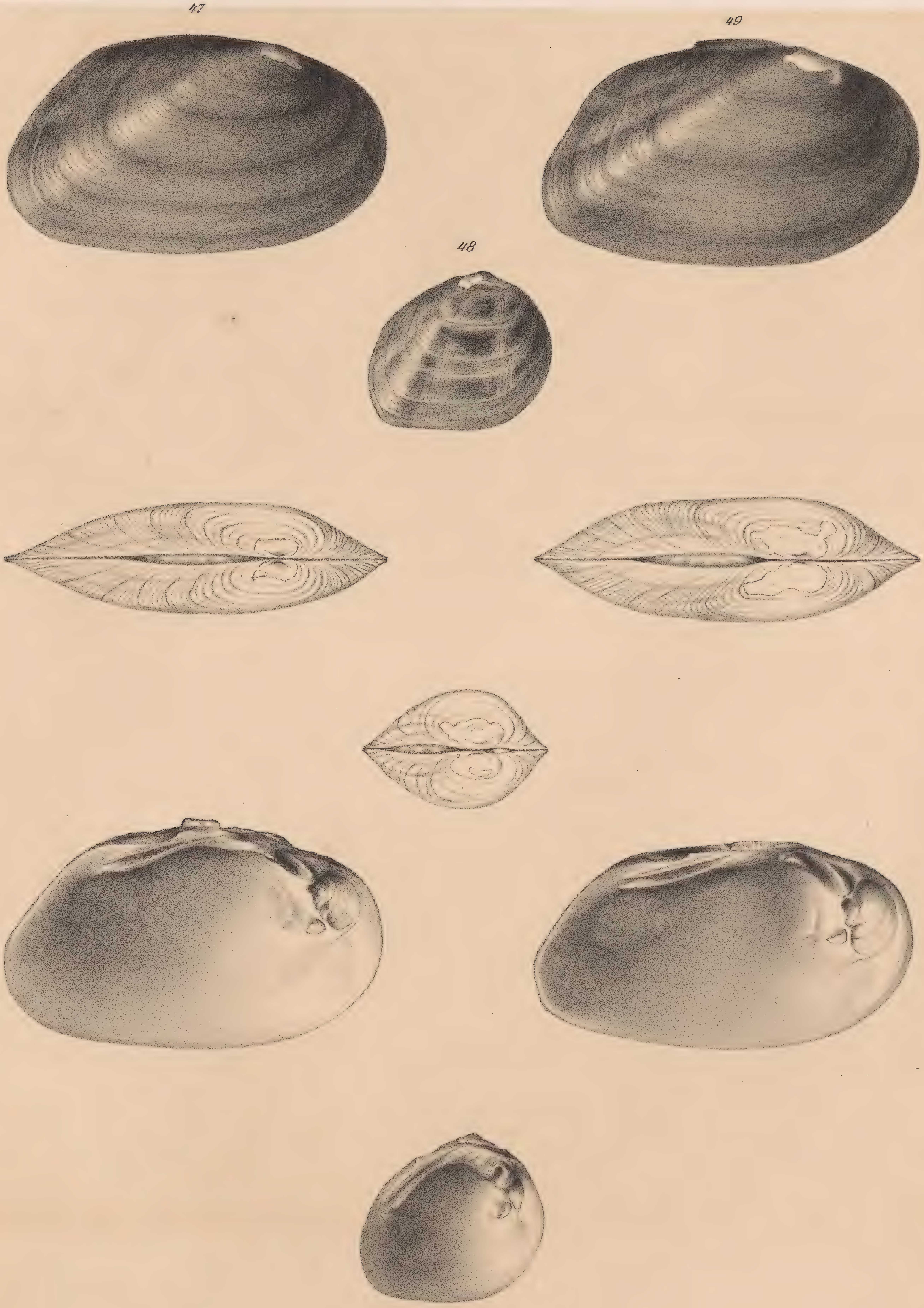
Diam. ·9, Length 1·4, Breadth 3 inches.

Shell smooth, oblong, compressed, flattened at the sides, very inequilateral; obtusely biangular behind, rounded before; substance of the shell somewhat thick; beaks a little prominent; ligament long, somewhat thick and brown; epidermis yellowish, radiated or without rays and with distant marks of growth; umbonial slope rounded; posterior slope carinate; cardinal teeth small, lobed, double in both valves; lateral teeth very long and straight; anterior cicatrices distinct, large and well impressed; posterior cicatrices distinct, large and moderately impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell very shallow and wide; cavity of the beaks very small and wide; nacre white, purple or salmon color and iridescent.

Remarks.—I have several specimens of this species, but none perfect enough in the beaks to give the character of the tips. Some have a few rays; generally they were without rays, the prevailing character of the epidermis being yellowish. All the specimens but two had white nacre: one was purple and one salmon colored. This species is nearly allied to *Raënsis* and *aberrans* (nobis), also to *subparallelus* herein described.

UNIO RATUS. Pl. 18, fig. 51.

Testa lævi, quadrata, subcompressa, ad latere subplanulata; valde inæquilaterali, postice obtuse angulata, antice rotunda; valvulis subcrassis, antice crassioribus; natibus prominulis; epidermide tenebroso-olivacea, eradiata; dentibus cardinalibus parvis, subconicis, sulcosis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis subcurvisque; margarita purpurascente et valde iridescente.



47 *Unio ligatus.*
48 *Unio bellulus.*
49 *Unio infuscus.*

Shell smooth, quadrate, somewhat compressed, slightly flattened at the sides, very inequilateral, obtusely angular behind, rounded before; valves somewhat thick, thicker before; beaks somewhat prominent; epidermis dark olive, without rays; cardinal teeth small, subconical, sulcate and double in both valves; lateral teeth rather long and somewhat curved; nacre purplish and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 160.

Hab.—Neuse River, North Carolina, Prof. E. Emmons.

My cabinet.

Diam. ·8, Length 1·2, Breadth 2·2 inches.

Shell smooth, quadrate, somewhat compressed, slightly flattened at the sides, very inequilateral, obtusely angular behind and rounded before; substance of the shell somewhat thick, slightly thicker before; beaks somewhat prominent; ligament rather thin and dark brown; epidermis dark olive, without rays and with distant marks of growth; umbonial slope obtusely angular; posterior slope subcarinate and narrow elliptical; cardinal teeth small, subconical, sulcate and double in both valves; lateral teeth rather long, lamellate and somewhat curved; anterior cicatrices distinct, well impressed and corrugate; lateral cicatrices confluent, large, indistinct; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell not deep; cavity of the beaks scarcely perceptible; nacre purplish and very iridescent.

Remarks.—A single specimen was received a long time since from Dr. Emmons. The description has been deferred with the hope of other and better specimens being found. The beaks being eroded, the character of the tips cannot be observed. In outline it is near to *hebes* (nobis), but it is not so high on the carina. It reminds one of *subgibbosus* (nobis).

UNIO DISSIMILIS. Pl. 18, fig. 52.

Testa lævi, sublata, compressa, ad latere planulata, valde inæquilaterali, postice obtuse angulari, antice rotunda; valvulis subtenuibus; natibus prominulis; epidermide tenebroso-fusca, micanti, eradiata; dentibus cardinalibus parviusculis, subcompressis, sulcosis, in utroque valvulo duplicibus; lateralibus prælongis, lamellatis subrectisque; margarita alba et valde iridescente.

Shell smooth, rather wide, compressed, flattened at the sides, very inequilateral, obtusely angular behind, round before; valves rather thin; beaks slightly prominent; epidermis dark brown, shining, without rays; cardinal teeth rather small, somewhat compressed, sulcose, double in both valves; lateral teeth very long, lamellar and nearly straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1872, p. 161.

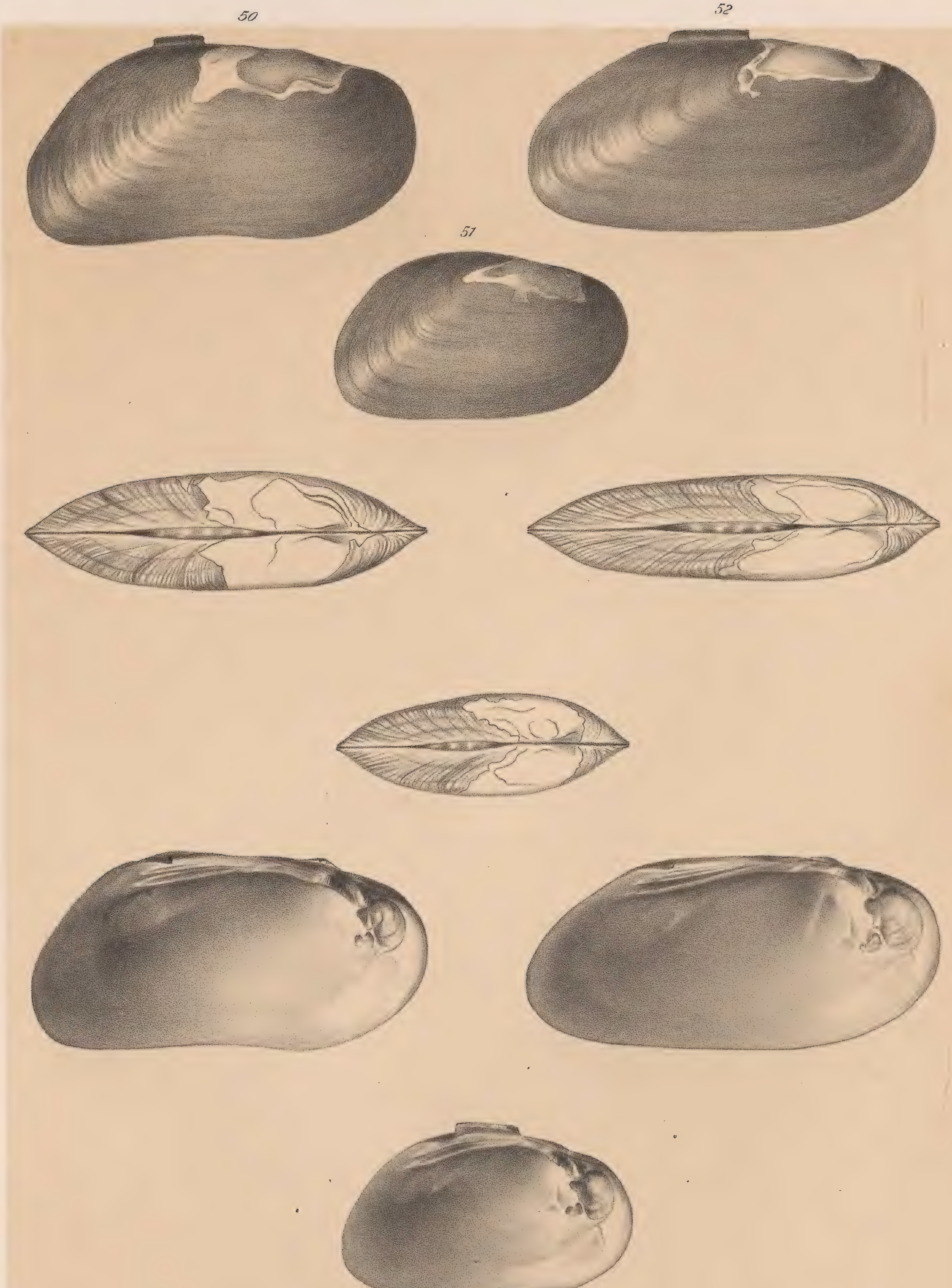
Hab.—Long Creek, Gaston Co., and Pfeiffer's Pond, Mecklenburg Co., North Carolina, C. M. Wheatley.

My cabinet and cabinet of C. M. Wheatley.

Diam. ·8, Length 1·5, Breadth 3·1 inches.

Shell smooth, rather wide, compressed, flattened at the sides, very inequilateral, obtusely angular behind, round before; substance of the shell rather thin, slightly thicker before; beaks slightly prominent; ligament long, somewhat thick and light brown; epidermis dark brown, shining, without rays, with rather close marks of growth; umbonial slope rounded; posterior slope narrow elliptical, with indistinct lines from the tips of the beaks to the margin; cardinal teeth rather small, somewhat compressed, sulcose and double in both valves; lateral teeth very long, lamellar and nearly straight; anterior cicatrices distinct, large and moderately impressed; lateral cicatrices confluent, large and slightly impressed; dorsal cicatrices placed over the centre of the cavity of the beaks; cavity of the shell very shallow and wide; cavity of the beaks scarcely observable; nacre white and iridescent.

Remarks.—Neither of the six specimens before me has beaks perfect enough to exhibit the undulations of the tips. In outline it is near to *viridiradiatus* (nobis), but it is wider and more flat. It is also in outline near to *pullatus* (nobis), but is not so thick in the valves, while it is more compressed.



50 Unio oblongus.
51 Unio ratus.
52 Unio dissimilis.

T. Sinclair & Son, lith. Phila.

SUPPLEMENT

TO

ISAAC LEA'S PAPER ON UNIONIDÆ.

UNIO CIRRATUS. Pl. 19, fig. 53.

Testa lævi, oblonga, subcompressa, inæquilaterali, postice obtuse biangulari, antice rotunda; valvulis subcrassis, antice parum crassioribus; natibus prominulis; epidermide tenebroso-fusca, subcirrata, eradiata; dentibus cardinalibus parviusculis, sulcatis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis subrectisque; margarita vel alba vel salmonis colore tincta et valde iridescente.

Shell smooth, oblong, somewhat compressed, inequilateral, obtusely biangular behind, round before; valves somewhat thick, a little thicker before; beaks a little prominent; epidermis dark brown, somewhat roughened, without rays; cardinal teeth rather small, sulcate, double in both valves; lateral teeth rather long, lamellar and nearly straight; nacre white or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1873, p. 422.

Hab.—Abbeville District, South Carolina, Dr. J. P. Barratt.

My cabinet and cabinet of C. M. Wheatley.

Diam. 1·1, Length 1·8, Breadth 3·2 inches.

Shell smooth, oblong, somewhat compressed, inequilateral, obtusely biangular behind, round before; substance of the shell somewhat thick, a little thicker before; beaks a little prominent; ligament rather large and dark brown; epidermis dark brown, somewhat roughened, without rays and with rather close marks of growth; umbonial slope somewhat raised and rounded; posterior slope subcarinate, elliptical; cardinal teeth rather small, sulcate and double in both valves; lateral teeth rather long, lamellar and nearly straight; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and moderately impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and rounded; nacre white or salmon color and very iridescent.

Remarks.—This species is closely allied to *Abbevillensis* (nobis), and is from the same locality. For a long time I thought it a variety of that species, but by additional specimens I am satisfied that it is distinct. It may be distinguished by its being more quadrate, of a darker epidermis, and having the marks of growth much more close. None of these specimens have the beaks sufficiently perfect to display the undulations of the tips.

UNIO HASTATUS. Pl. 19, fig. 54.

Testa lævi, transversa, subcompressa, valde inæquilaterali, postice angulata, antice rotunda; valvulis crassiusculis, antice parum crassioribus; natibus prominulis; epidermide luteo-oliva, obsolete radiata; dentibus cardinalibus parvis, subcompressis crenulatisque; lateralibus longis, lamellatis subrectisque; margarita alba et valde iridescente.

Shell smooth, transverse, somewhat compressed, very inequilateral, angular behind and round before; valves somewhat thick, slightly thicker before; beaks slightly raised; epidermis yellowish-olive, obscurely rayed; cardinal teeth small, somewhat compressed and crenulate; lateral teeth long, lamellar and nearly straight; nacre white and very iridescent.

Proc. Acad. Nat. Sci., 1873, p. 423.

Hab.—New-Market, Abbeville District, South Carolina, Dr. L. R. Gibbs and Dr. J. P. Barratt; Rocky Creek, near Macon, Georgia, J. C. Plant.

My cabinet.

Diam. ·6, Length 1·1, Breadth 2·5 inches.

Shell smooth, transverse, somewhat compressed, very inequilateral, angular behind, round before; substance of the shell somewhat thick, slightly thicker before; beaks slightly raised; ligament long, thin and light brown; epidermis yellowish-olive, obscurely rayed, with distant marks of growth; umbonial slope very slightly raised and rounded; posterior slope narrow elliptical, slightly carinate; cardinal teeth small, somewhat compressed and crenulate; lateral teeth long, lamellar and nearly straight; anterior cicatrices distinct, rather large and somewhat impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell wide and very shallow; cavity of the beaks very shallow; nacre white and very iridescent.

Remarks.—Many years since I received two specimens of this species from Prof. Gibbs, and shortly afterwards a single valve from the late Dr. Barratt.

I was greatly in hopes of getting more and better specimens, but none have been observed, to my knowledge. The outline is somewhat like that of *Barrattii* (nobis), but that species is not so transverse, is darker in the epidermis and has more rays. It is also a straighter shell. It properly comes between *Barrattii* and *productus* Con. It cannot be confounded with the latter shell. Neither specimen has beaks perfect enough to display any undulations of the tips.

UNIO STRUMOSUS. Pl. 19, fig. 55.

Testa lævi, rotundata, inflata, inæquilaterali, postice obtuse angulata, antice rotundata; valvulis crassis; natibus prominulis; epidermide tenebroso-fusca vel nigra, eradiata; dentibus cardinalibus subgrandibus, rugosis, in utroque valvulo duplicibus; lateralibus longis, rugosis curvatisque; margarita alba et iridescente.

Shell smooth, rounded, inflated, inequilateral, obtusely angular behind, rounded before; valves thick; beaks a little prominent; epidermis dark brown or black, without rays; cardinal teeth rather large, rugose, double in both valves; lateral teeth long, rugose and curved; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1873, p. 423.

Hab.—Yadkin River, North Carolina, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1, Length 1·7, Breadth 2·6 inches.

Shell smooth, rounded, inflated, inequilateral, obtusely angular behind, rounded before; substance of the shell thick; beaks a little prominent; ligament large and dark brown; epidermis dark brown or black, without rays, with distant marks of growth; umbonial slope obtusely angular; posterior slope somewhat raised and narrow elliptical; cardinal teeth rather large, rugose and double in both valves; lateral teeth long, lamellar, rugose and curved; anterior cicatrices distinct, rather large and well impressed; lateral cicatrices confluent and large; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather large and somewhat deep; cavity of the beaks rather deep and obtusely angular; nacre white and iridescent.

Remarks.—The three specimens before me are all white. One has a slight tint of salmon color. Others may be found purple or deep salmon. Neither of these specimens is in good condition, and the beaks being much eroded there is no indication of the undulations of the tips. In outline it is allied to *rotundatus* Lam., but cannot be confounded with that species.

UNIO SUBOLIVACEUS. Pl. 20, fig. 56.

Testa lævi, oblonga, subcompressa, inæquilaterali, postice obtuse angulari, antice rotundata; valvulis crassis, antice parum crassioribus; natibus prominulis; epidermide luteo-olivacea, subnitida, eradiata; dentibus cardinalibus grandis, sulcatis, in utroque valvulo duplicibus; lateralibus percrassis obliquisque; margarita alba et iridescente.

Shell smooth, oblong, somewhat compressed, inequilateral, obtusely angular behind and rounded before; valves thick, rather thicker before; beaks slightly prominent; epidermis yellowish-olive, somewhat shining, without rays; cardinal teeth large, sulcate, double in both valves; lateral teeth very thick and oblique; nacre white and iridescent.

Proc. Acad. Nat. Sci., 1873, p. 422.

Hab.—Catawba River, Fox and Yadkin Rivers, N. Carolina, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1·1, Length 1·7, Breadth 2·7 inches.

Shell smooth, oblong, somewhat compressed, inequilateral, obtusely angular behind, rounded before; substance of the shell thick, rather thicker before; beaks slightly prominent; ligament short, thick and light brown; epidermis yellowish-olive, somewhat shining, without rays and with rather distant marks of growth; umbonial slope raised and obtusely angular; posterior slope subcarinate, elliptical, with impressed lines from the beaks to the posterior margin; cardinal teeth large, sulcate, double in both valves; lateral teeth very thick, corrugate and oblique; anterior cicatrices distinct, large and well impressed; posterior cicatrices confluent, large and moderately impressed; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks rounded; nacre white and iridescent.

Remarks.—I have eight specimens before me from different habitats. All have a pale olivaceous epidermis. In outline and general character it is closely allied to *U. Savannahensis* (nobis). It is rather smaller, more compressed, and differs in the color of the epidermis. None have beaks perfect enough to exhibit the character of the tips.

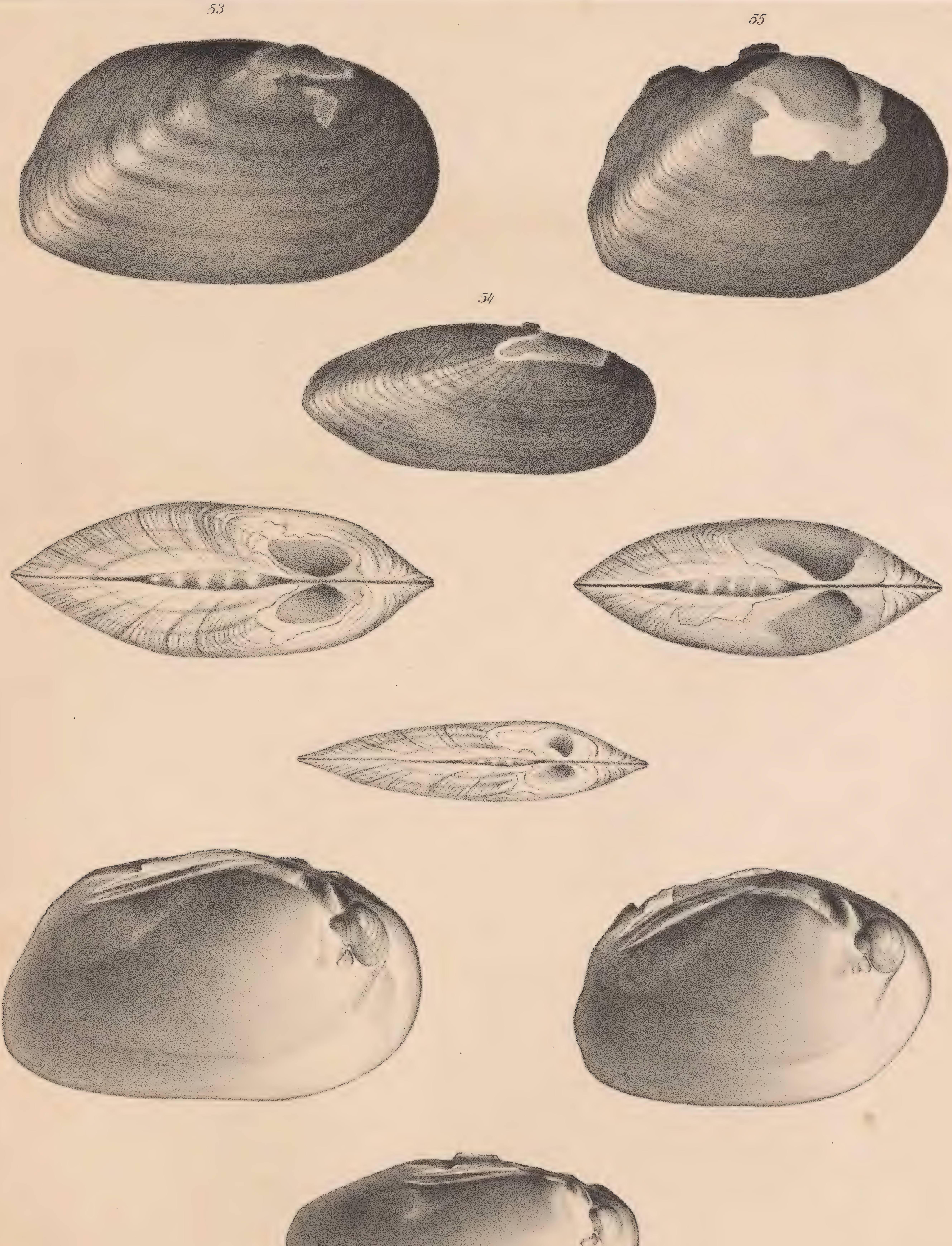
UNIO SUBCYLINDRACEUS. Pl. 20, fig. 57.

Testa lævi, valde transversa, subcylindracea, valde inæquilaterali, postice obtuse biangulari, antice oblique rotundata; valvulis crassis, antice parum crassioribus; natibus prominulis; epidermide luteo-viridi, perradiata; dentibus cardinalibus subparvis, compresso-conicis crenulatisque; lateralibus prælongis, lamellatis subrectisque; margarita vel alba vel purpurea vel salmonia coloris tincta et valde iridescente.

Shell smooth, very transverse, subcylindrical, very inequilateral, obtusely biangular behind, obliquely rounded before; valves thick, somewhat thicker before; beaks a little prominent; epidermis yellowish-green, much radiated; cardinal teeth rather small, compressed conical and crenulate; lateral teeth very long, lamellar and nearly straight; nacre white, purple or salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1873, p. 422.

Hab.—Rocky Creek, near Macon, Georgia, J. C. Plant; and Carter's Creek, Georgia, J. Postell.



53 *Unio cirratus.*
54 *Unio hastatus.*
55 *Unio strumosus.*

T. Sinclair & Son lith, Phila.

My cabinet, and cabinet of J. C. Plant.

Diam. 1·1, Length 1·6, Breadth 3·8 inches.

Shell smooth, very transverse, subcylindrical, very inequilateral, obtusely biangular behind, obliquely rounded before; substance of the shell thick, somewhat thicker before; beaks a little prominent; ligament long, rather thick and light brown; epidermis yellowish-green, much radiated and with rather distant marks of growth; umbonial slope very obtusely angular; posterior slope scarcely raised, narrow elliptical, with two impressed lines in each valve from the beaks to the posterior margin; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent and well impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell wide and somewhat deep; cavity of the beaks very shallow, scarcely observable; nacre white, purple or salmon color and very iridescent.

Remarks.—There are four specimens before me, all of different ages. Three are from Mr. Plant and one, the youngest, from Mr. Postell. None of them are perfect enough to present the undulations of the beaks. In outline it is nearest to *exacutus* (nobis), but it is a stouter species and not quite so transverse.

UNIO CORNEUS. Pl. 20, fig. 58.

Testa lævi, oblonga, subcompressa, ad latere parum planulata, inæquilaterali, postice biangulari, antice rotundata; valvulis crassiusculis; natibus prominulis; epidermide cornea, perradiata; dentibus cardinalibus crassiusculis et in utroque valvulo duplicibus; lateralibus longis, crassis subcurvisque; margarita pallido-purpurea vel salmonis colore tincta et iridescente.

Shell smooth, oblong, somewhat compressed, at the side slightly flattened, inequilateral, biangular behind and rounded before; valves somewhat thick; beaks slightly prominent; epidermis horn color, very much radiated; cardinal teeth somewhat thick and double in both valves; lateral teeth long, thick and somewhat curved; nacre pale purple or salmon and iridescent.

Proc. Acad. Nat. Sci., 1873, p. 423.

Hab.—Columbus, Georgia, G. Hallenbeck; Abbeville District, South Carolina, Dr. Barratt; Marietta, Georgia, J. C. Anthony.

My cabinet and cabinet of Mr. Anthony.

Diam. ·8, Length 1·4, Breadth 2·1 inches.

Shell smooth, oblong, somewhat compressed, at the side slightly flattened, inequilateral, biangular behind and rounded before; substance of the shell somewhat thick; beaks slightly prominent; ligament rather long, narrow and light brown; epidermis horn color, nearly covered with green rays, with rather distant marks of growth; umbonial slope very slightly raised and obtusely angular; posterior slope carinate, narrow elliptical, with two green rays in each valve; cardinal teeth somewhat thick, corrugate and double in both valves; lateral teeth long, thick and somewhat curved; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks very shallow and rounded; nacre pale purple or salmon and iridescent.

Remarks.—I have had several specimens of this species in my possession for some years. Only one, which is figured, seems to be full grown. It is closely allied to *Abbevillensis* (nobis) and I have had doubts of its being more than a variety, but the specimens subsequently received have satisfied me as to its being distinct. While nearly of the outline of *Abbevillensis* it differs in not being so yellow in the epidermis, and in being usually covered with green capillary rays. It is devoid of the strong marks of growth which are so remarkable in that species. None of the specimens had perfect beaks—therefore the undulations are not known.

UNIO INFULGENS. Pl. 21, fig. 59.

Testa lævi, suboblonga, inflata, inæquilaterali, postice subbiangulari, antice rotundata; valvulis crassis, antice parum crassioribus; natibus prominulis; epidermide nitida, polita, eradiata; dentibus cardinalibus subgrandibus, sulcatis et in utroque valvulo duplicibus; lateralibus longis, crassis subrectisque; margarita salmonis colore tincta et valde iridescente.

Shell smooth, suboblong, inflated, inequilateral, subbiangular behind, rounded before; valves thick, rather thicker before; beaks slightly prominent; epidermis bright, polished and without rays; cardinal teeth rather large, sulcate and double in both valves; lateral teeth long, thick and nearly straight; nacre salmon colored and very iridescent.

Proc. Acad. Nat. Sci., 1873, p. 422.

Hab.—Stewart's Pond, Union Co., North Carolina, C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1·3, Length 2, Breadth 3·4 inches.

Shell smooth, suboblong, inflated, inequilateral, subbiangular behind and rounded before; substance of the shell thick, rather thicker before; beaks slightly prominent; ligament large, thick and dark brown; epidermis bright, polished, without rays and with rather distant marks of growth; umbonial slope somewhat raised and obtusely angular; posterior slope carinate, with a broad slightly impressed groove from the beaks to the posterior margin; cardinal teeth rather large, sulcate and double in both valves; lateral teeth long, thick, slightly corrugate and nearly

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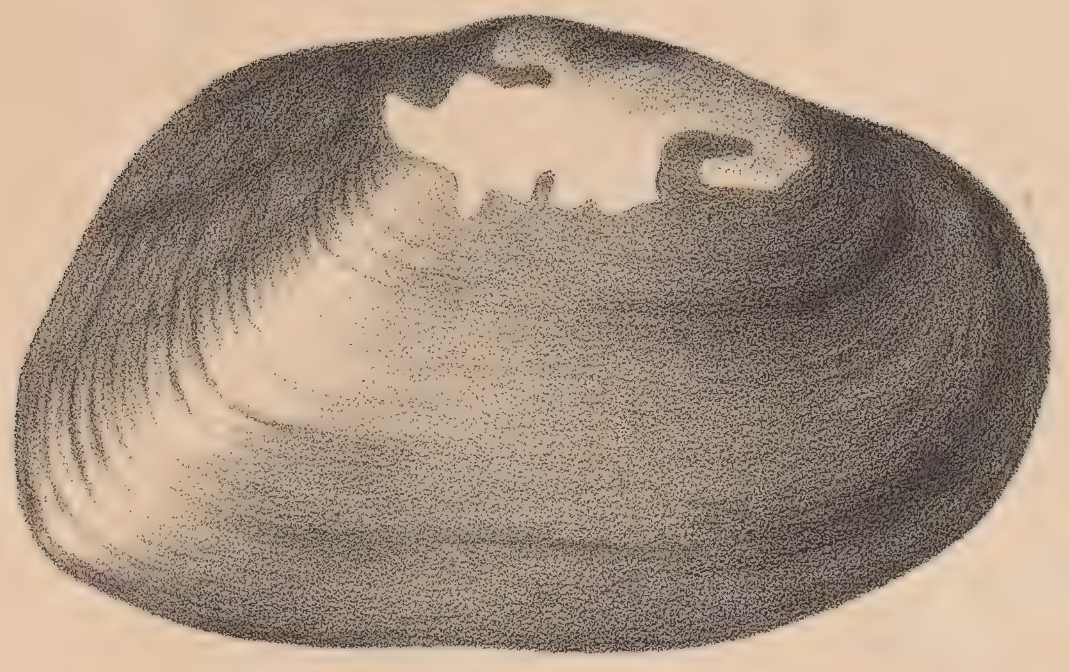

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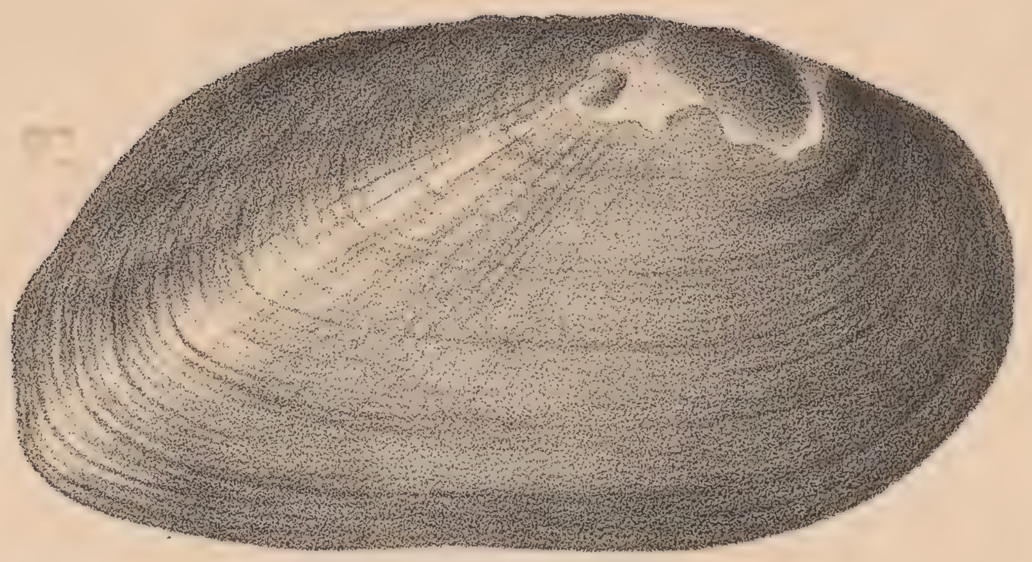

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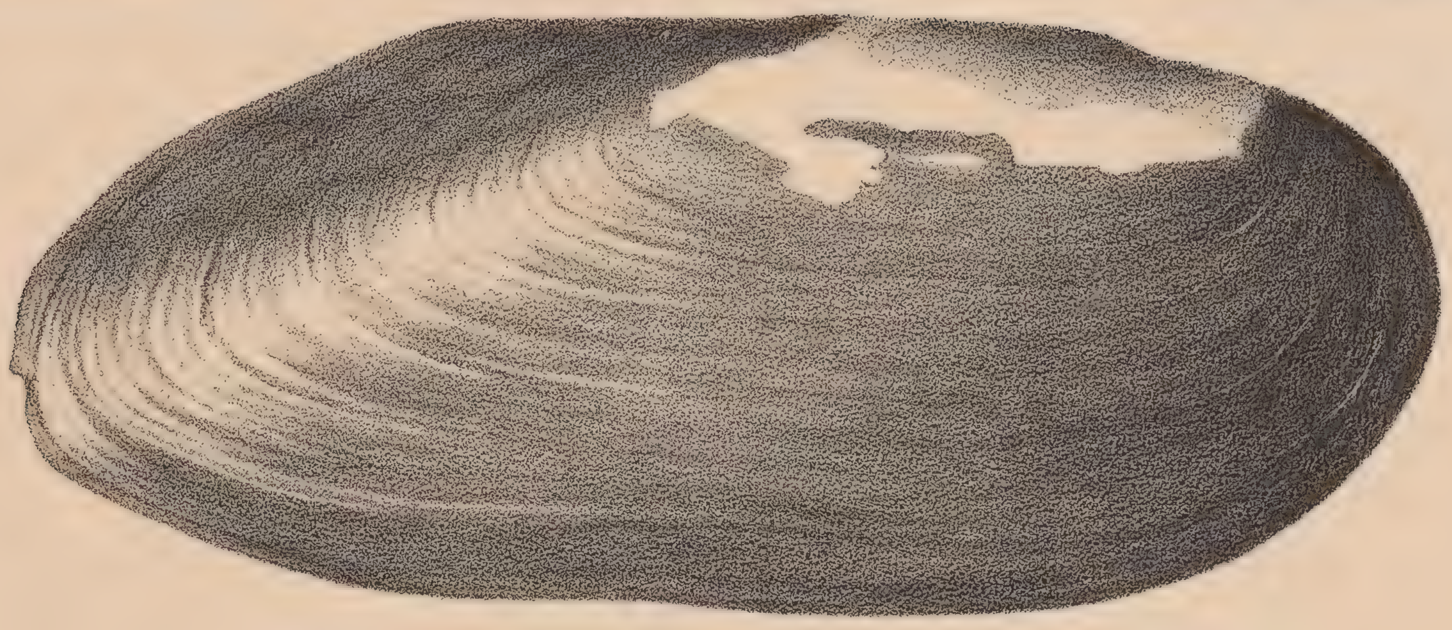
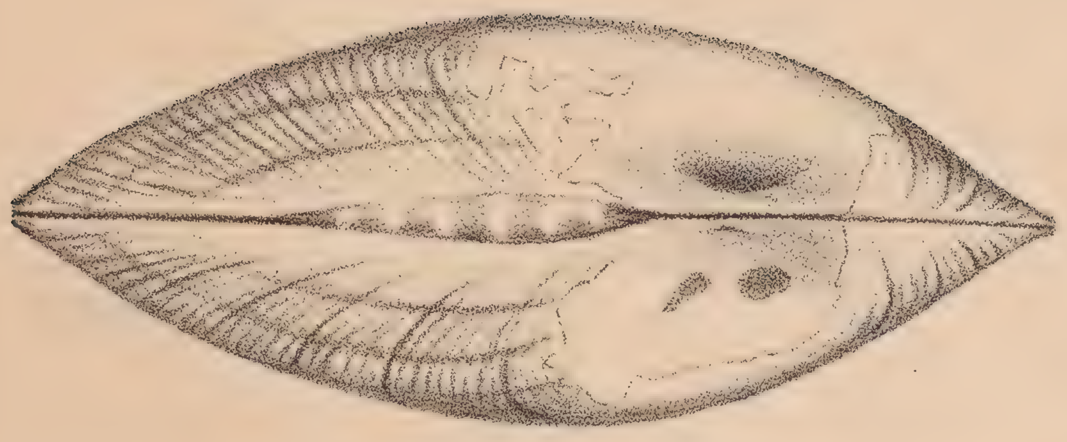
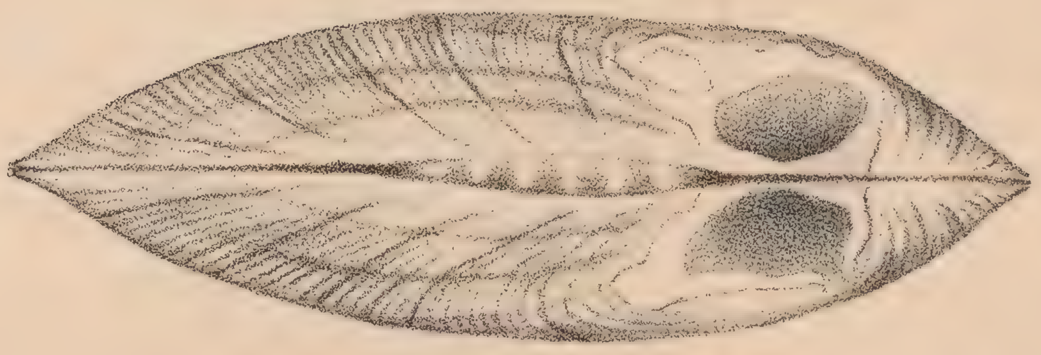
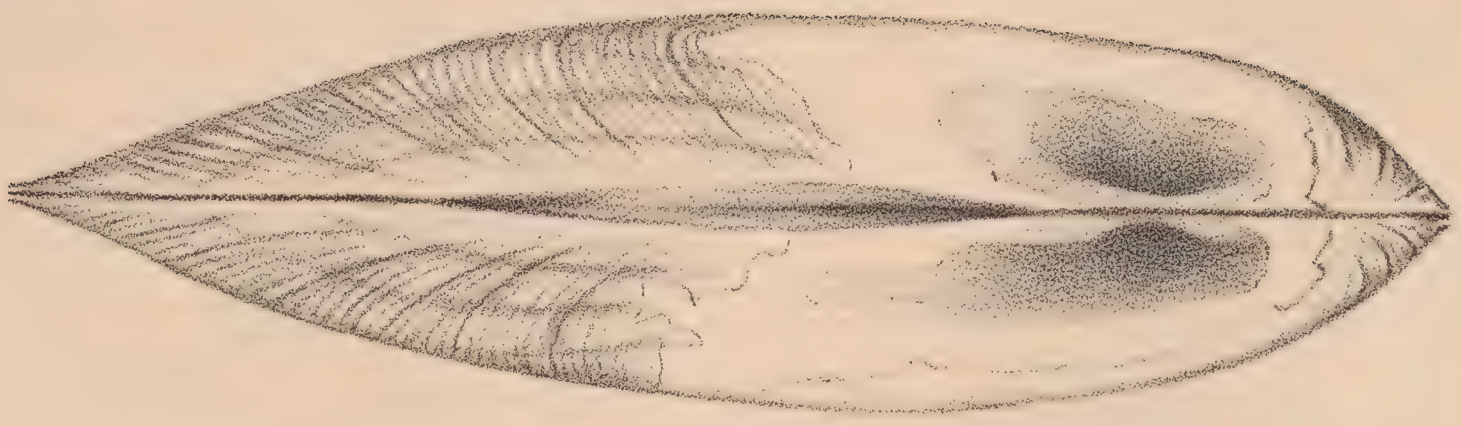
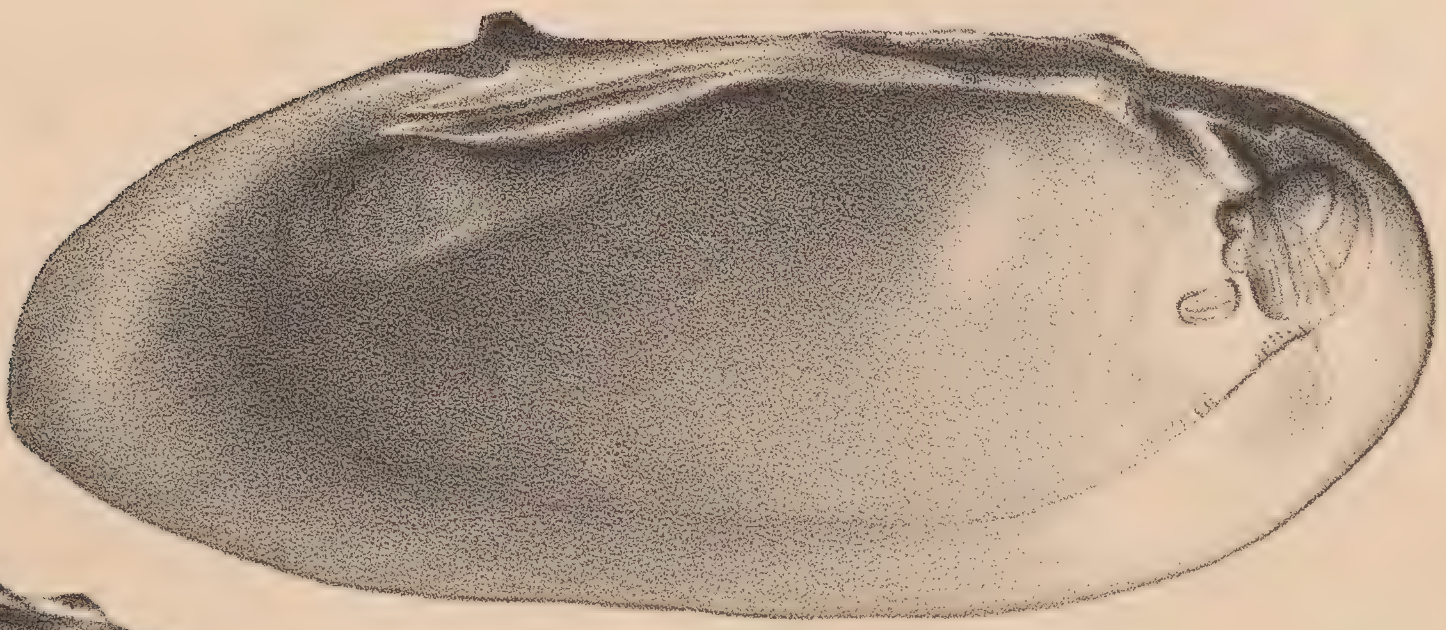
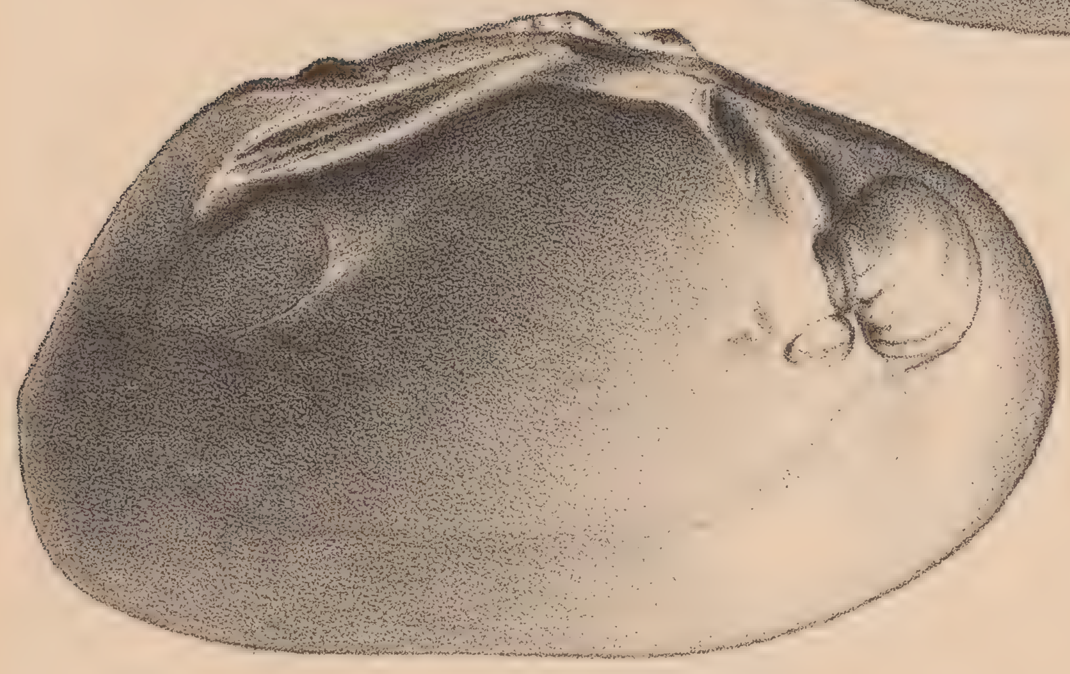


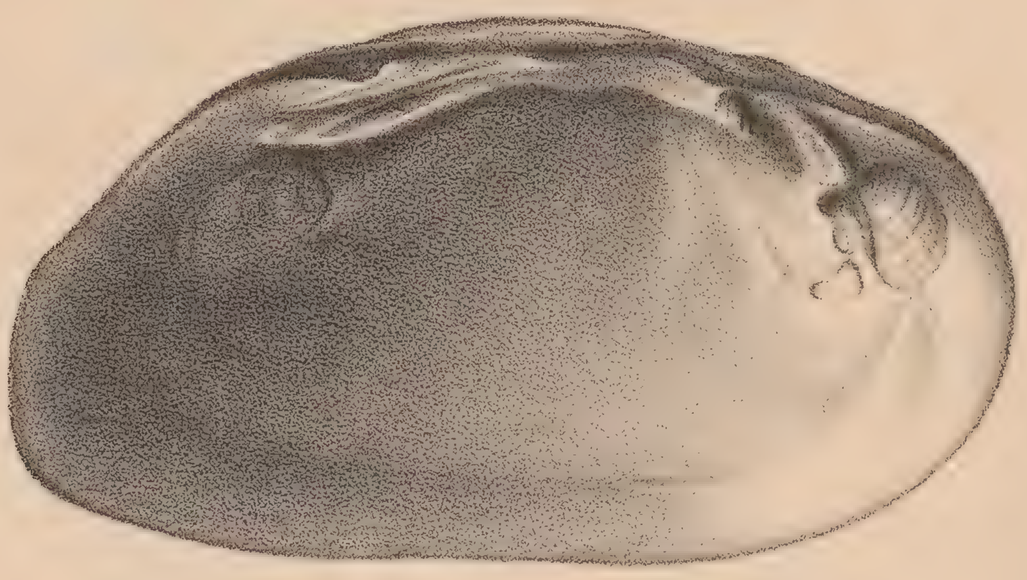












56 *Unio subolivaceus.*
57 *Unio subcylindraceus.*
58 *Unio corneus.*

T. Sinclair & Son, lith, Phila

straight; anterior cicatrices distinct, large and deeply impressed; posterior cicatrices confluent, large and well impressed; dorsal cicatrices placed above the cavity of the beaks; cavity of the shell wide and somewhat deep; cavity of the beaks shallow and rounded; nacre salmon colored and very iridescent.

Remarks.—Among the numerous *Unionidæ* received by Mr. Wheatley from North Carolina were five of this species, which I believe has not been before described. It is nearest in outline to *U. Savannahensis* (nobis), but differs in being not so oblong, in having a remarkably polished epidermis, giving it the appearance of having been varnished. All these fine specimens have a more or less tint of salmon color. Other specimens may be found to be purple or white. None of the beaks were perfect enough to exhibit undulations at the tips.

SCHIZOSTOMA LEWISII. Pl. 21, fig. 16.

Testa crebrissime striata, subcylindracea, subtenui, luteo-fusca, imperforata; spira conica, plicata; suturis valde impressis; anfractibus instar septenis, ultimo grandi; fissura obliqua brevique; apertura grandi, rhomboidea, intus vittata; labro crenulato, sinuoso; columella alba, incrassata et contorta.

Shell closely striate, subcylindrical, rather thin, yellowish-brown, imperforate; spire conical, folded; sutures very much impressed; whorls about seven, the last one large; fissure oblique and short; aperture large, rhomboidal, banded within outer tip crenulate and sinuous; columella white, thickened and twisted.

Proc. Acad. Nat. Sci., 1869, p. 125.

Hab.—Coosa River, Alabama, Dr. E. R. Schowalter.

My cabinet and cabinets of Dr. Schowalter, C. M. Wheatley, Dr. Hartman and Dr. Lewis.

Diam. ·5, Length ·9 inch.

Remarks.—A fine suite of different ages was sent to me by Dr. Schowalter. There can be no doubt as to its being an undescribed species. At first view it would be mistaken for *Goniobasis impressa* (nobis), but the well-indented cut at once distinguished it. It differs also, slightly, in having the striæ rather coarser and the length being less. The colored bands are very nearly the same. In the young the ground is yellow with five well-defined brown bands inside, and the folds are rather close and not much raised. I have great pleasure in naming it after James Lewis, M.D., who has done so much to make our fresh-water Molluscs known. Aperture about half the length of the shell.

GONIOBASIS LAWRENCEI. Pl. 21, fig. 17.

Testa lævi, subcylindracea, subcrassa, tenebroso-cornea, dilute vittata vel evittata; spira elevata; suturis impressis; anfractibus planulatis; apertura parviuscula, rhomboidea, intus albida; labro acuto, sigmoideo; columella incrassata et contorta.

Shell smooth, subcylindrical, rather thick, dark horn color, faintly banded or without bands; spire raised; sutures impressed; whorls flattened; aperture rather small, rhombic, white within; outer lip acute, sigmoid; columella thickened and twisted.

Proc. Acad. Nat. Sci., 1869, p. 125.

Hab.—Washita River, near Hot Springs, Arkansas, Dr. Lawrence.

My cabinet and cabinet of Smithsonian Institution.

Diam. ·3, Length 1 inch.

Remarks.—Ten specimens were sent by the Smithsonion Institution, not one of which was nearly perfect, but some were sufficiently so to satisfy me of its being undescribed. One only had bands, three in number and indistinct. The epidermis in all is uniformly of a solid polished appearance. The basal channel is wide and turned back, and resembles *G. Chrystii* (nobis) in this character. The specimens were all too much eroded to enable me to ascertain the number of whorls. The upper whorls may in perfect specimens be found to be folded or carinate. Aperture about one-fourth the length of the shell.

GONIOBASIS BACULOIDES. Pl. 21, fig. 18.

Testa lævi, cylindracea, subtenui, luteola, quadrivittata; spira valde elevata; suturis irregulariter impressis; anfractibus planulatis; apertura parva, rhomboidea, intus vittata et cæruleo-alba; labro acuto, vix sinuoso; columella vix incrassata, contorta.

Shell smooth, cylindrical, rather thin, yellowish, four banded; spire much elevated; sutures irregularly impressed; whorls flattened; aperture small, rhombic, banded and bluish-white within; outer lip acute, scarcely sinuous; columella slightly thickened, twisted.

Proc. Acad. Nat. Sci., 1869, p. 125.

Hab.—Coosa River, Alabama, Dr. E. R. Schowalter.

My cabinet and cabinets of Dr. Schowalter and Mr. Wheatley.

Diam. ·4, Length 1·2 inch.

Remarks.—Two specimens only of this fine species were sent to me by Dr. Schowalter. It must be rare in the Coosa, as he has only recently found it after so many years' explorations. It has some resemblance to *fascinans* (nobis), but differs in being larger, being cylindrical and having four bands, while *fascinans* has but three. Neither of the two specimens before me is perfect in the upper whorls, so that the character of the upper ones cannot be ascertained, nor can their number. I presume there must be nearly ten. In the larger and more perfect specimen there is a disposition to put on obtuse and indistinct folds. Aperture more than one-fourth the length of the shell.

PHYSA CARLTONII. Pl. 21, fig. 19.

Testa lævi, obtuse fusiformi, inflata, valde polita, tenui, subpurpurea; spira excerta, acuminata; suturis impressis; anfractibus senis, ultimo pergrandi; apertura ovata, grandi; labro expanso, intus marginato; columella impressa et contorta.

Shell smooth, obtusely fusiform, inflated, very bright, thin, purplish; spire raised, acuminate; sutures impressed; whorls six, the last very large; aperture ovate, large; outer lip expanded, margined within; columella impressed and twisted.

Proc. Acad. Nat. Sci., 1869, p. 125.

Hab.—Mount Diablo, California, W. G. W. Harford.

My cabinet and cabinets of Mr. Harford and Academy of Natural Sciences.

Diam. ·5, Length ·9 inch.

Remarks.—This is a remarkably fine large species, which I owe to Mr. Harford. It differs from any I have seen from California in the color and size. The largest specimen, which is slightly broken at the apex, is an inch long and more than half an inch wide. A specimen two-thirds grown is entirely perfect and presents a very graceful form. These specimens have generally two longitudinal bands of growth. These bands are strongly marked with two colors, dark brown and light salmon. The color of the shell is peculiar, approaching to a purplish mahogany color. There is no species from the Pacific States which this can be confounded with except *Lordi*, Baird, which is figured in the Smithsonian Miss. Col., Part II. p. 76, by Mr. Binney. I have specimens of *Lordi* which differ in being less inflated as well as in color. These shells were found in a creek in the vicinity of Mount Diablo by Mr. H. P. Carlton, and were given to Mr. Harford, who kindly sent them to me. I name the species after Mr. Carlton.

PHYSA WOLFIANA. Pl. 21, fig. 20.

Testa subrotunda, valde inflata, polita, tenui, tenebroso-cornea; spira valde obtusa; suturis impressis; anfractibus quaternis, ultimo pergrandi; apertura ovata, grandi; labro expanso; columella medio parum impressa et parum contorta.

Shell subrotund, very much inflated, bright, thin, dark horn color; spire very obtuse; sutures impressed; whorls four, the last one very large; aperture ovate and large; outer tip expanded; columella slightly impressed in the middle and slightly twisted.

Proc. Acad. Nat. Sci., 1869, p. 125.

Hab.—Hot Springs, Colorado Territory, Prof. J. W. Powell.

My cabinet and cabinets of Mr. J. Wolf and Academy of Natural Sciences.

Diam. ·2, Length ·3 inch.

Remarks.—A number of specimens were sent to me by Mr. John Wolf, of Canton, Illinois, and I name the species after him. Mr. Wolf writes to me that they were collected by Prof. J. W. Powell, of Bloomington, Illinois, and that they were obtained from the Hot Sulphur Springs in Colorado Territory, 6500 feet above the level of the sea. The temperature of the spring where the specimens were taken out was 110°. This species is nearest, perhaps, to *Cooperii*, Tryon, from Oregon, but it is larger, more inflated and of a darker color. The aperture is three-fourths the length of the shell.

UNIO DOOLEYENSIS. Pl. 22, fig. 60.

Testa lævi, oblonga, valde compressa, valde inæquilaterali, postice biangulari, antice rotundata; valvulis subtenuibus; natibus prominulis; epidermide luteo-oliva, obsolete radiata; dentibus cardinalibus parvis, in utroque valvulo duplicibus; lateralibus longis, lamellatis rectisque; margarita livida et iridescente.

Shell smooth, oblong, very much compressed, very inequilateral, biangular behind, rounded before; valves rather thin; beaks somewhat prominent; epidermis yellowish-olive, obscurely radiated; cardinal teeth small and double in both valves; lateral teeth long, lamellar and straight; nacre livid color and iridescent.

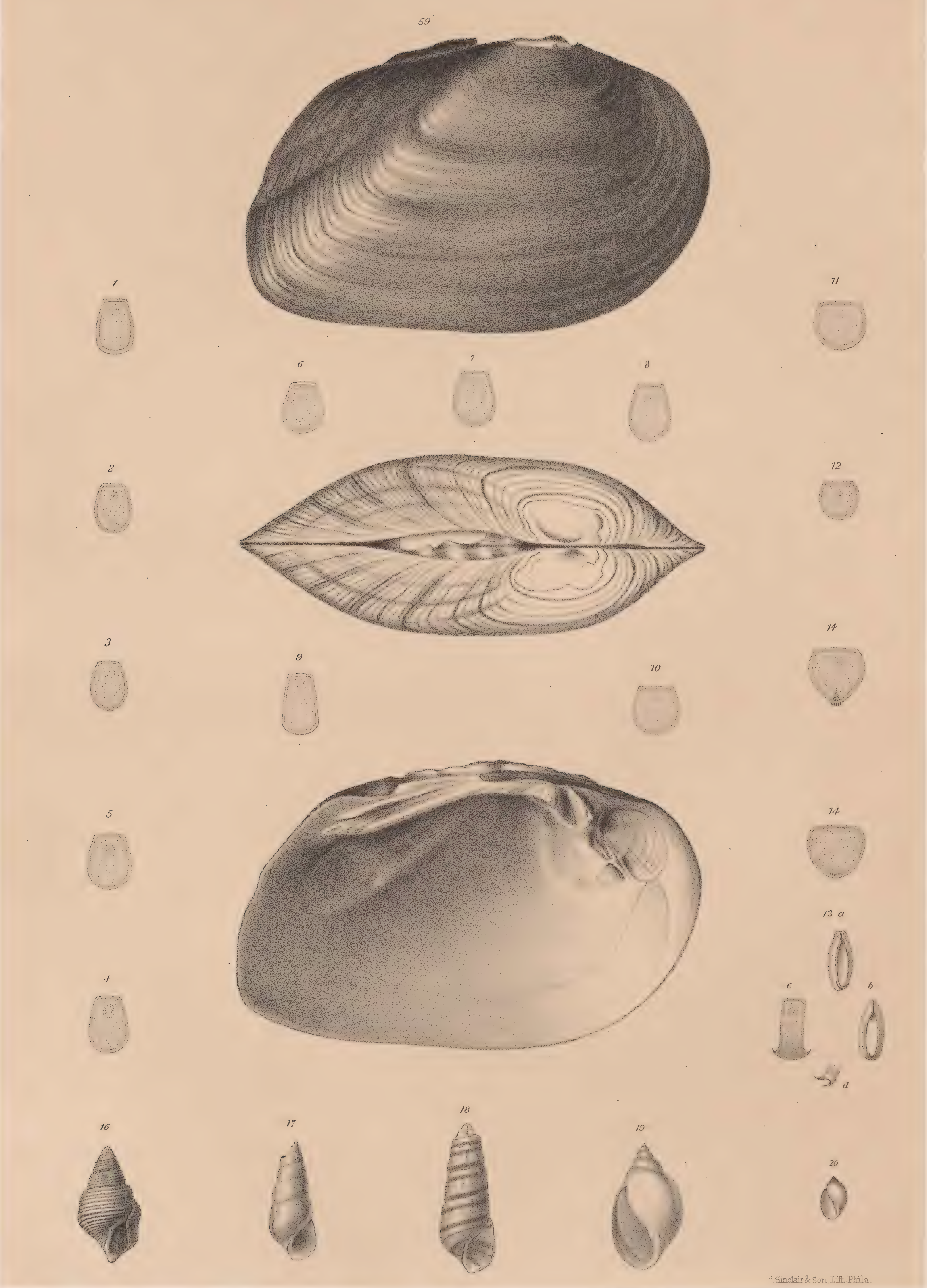
Proc. Acad. Nat. Sci., 1873, p. 424.

Hab.—Dooley Co., Georgia, Rev. G. White; Abbeville, South Carolina, Dr. J. P. Barratt.

My cabinet and cabinets of C. M. Wheatley and Dr. Lewis.

Diam. ·6, Length 1·2, Breadth 2·4 inches.

Shell smooth, oblong, very much compressed, very inequilateral, biangular behind and rounded before; substance of the shell rather thin; beaks somewhat prominent; ligament long, thin and dark brown; epidermis yellowish-olive, obscurely radiated, with rather distant marks of growth; umbonial slope oblique and obtusely angular; posterior slope narrow elliptical, rising to a wing, with a slightly impressed groove; cardinal teeth small, double in both valves and sulcate; lateral teeth long, lamellar and straight; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, large, very slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell



Sinclair & Son, Lith. Phila.

59. *Unio infulgens*

Embryonic form.
1. " *Nashvilleënsis.*
2. " *nasutus.*
3. " *parvus.*
4. " *concestator.*
5. " *rubellinus.*
6. " *excavatus.*
7. " *sudus.*

8. *Unio fallax.*

Embryonic form.
9. " *Clairbornensis*
10. " *gibbosus.*
11. " *Othcaloogensis*
12. " *tortivus.*
13. " *purpuratus.*
14. " *Tappanianus.*

15. *Marg. Spillmanii*

16. *Schizostoma Lewisii.*
17. *Goniobasis Lawrencei.*
18. " *baculoides.*
19. *Physa Carltonii.*
20. " *Wolfiana.*

shallow and wide; cavity of the beaks shallow and rounded; nacre livid color and very iridescent.

Remarks.—Quite a number of specimens have been in my possession for some time. Recently I have compared them with their allied species and am now satisfied the species is distinct from any described. It is very near in outline to *errans* (nobis), but it is not so stout. It is also allied to *Hallenbeckii* (nobis), but that species is much more ponderous and is of a darker epidermis.

UNIO GESNERII. Pl. 22, fig. 61.

Testa lævi, suboblonga, inflata, inæquilaterali, postice subbiangulari, antice oblique rotundata; valvulis subcrassis, antice crassioribus; natibus prominulis; epidermide tenebroso-fusca, vel radiata vel eradiata; dentibus cardinalibus crassiusculis, in utroque valvulo subduplicibus sulcatisque; lateralibus longis, crassis lamellatisque; margarita livida et iridescente.

Shell smooth, suboblong, inflated, inequilateral, subbiangular behind, obliquely rounded before; valves rather thick, thicker before; beaks somewhat prominent; epidermis dark brown, radiated or not radiated; cardinal teeth somewhat thick and somewhat double in both valves; lateral teeth long, thick and lamellar; nacre livid color and iridescent.

Proc. Acad. Nat. Sci., 1873, p. 424.

Hab.—Uchee River, near Columbus, Georgia, Dr. W. Gesner and Bishop Elliott. My cabinet and cabinet of Dr. Lewis.

Diam. ·9, Length 1·6, Breadth 3·1 inches.

Shell smooth, oblong, somewhat compressed, very inequilateral, subbiangular behind and rounded before; valves rather thick, somewhat thicker before; beaks somewhat prominent; ligament moderately thick and dark brown; epidermis dark brown, obscurely rayed, with rather distant marks of growth; umbonial slope rounded; posterior slope narrow elliptical; cardinal teeth rather small and sulcate, and somewhat double in both valves; lateral teeth long, thick and lamellar; anterior cicatrices distinct, rather large and well impressed; posterior cicatrices confluent, well impressed and large; dorsal cicatrices above the centre of the cavity of the beaks; cavity of the shell wide and rather shallow; cavity of the beaks very shallow and rounded; nacre livid color and iridescent.

Remarks.—Eight specimens of various ages were sent to me by Dr. Lewis, who received them from Dr. Gesner, and I am glad to name the species in honor of him. One specimen came from Bishop Elliott. In outline it is near to *Chathamensis* (nobis) and reminds one of *errans* (nobis), but it may easily be distinguished from them. The younger specimens all have close, fine rays over the whole disk. The undulations of the tips of the beaks of the young and perfect specimens are very much like those of *complanatus*, Sol.

UNIO INVENUSTUS. Pl. 22, fig. 62.

Testa lævi, oblonga, subcompressa, valde inæquilaterali, postice subbiangulari, antice rotundata; valvulis crassiusculis, antice aliquanto crassioribus; natibus prominulis; epidermide tenebroso-fusca, obsolete radiata; dentibus cardinalibus parviusculis sulcatisque; lateralibus sublongis, curvatis lamellatisque; margarita livida et iridescente.

Shell smooth, oblong, somewhat compressed, very inequilateral, subbiangular behind and rounded before; valves rather thick, somewhat thicker before; beaks somewhat prominent; epidermis dark brown, obscurely rayed; cardinal teeth rather small and sulcate; lateral teeth rather long, curved and lamellar; nacre livid color and iridescent.

Proc. Acad. Nat. Sci., 1873, p. 424.

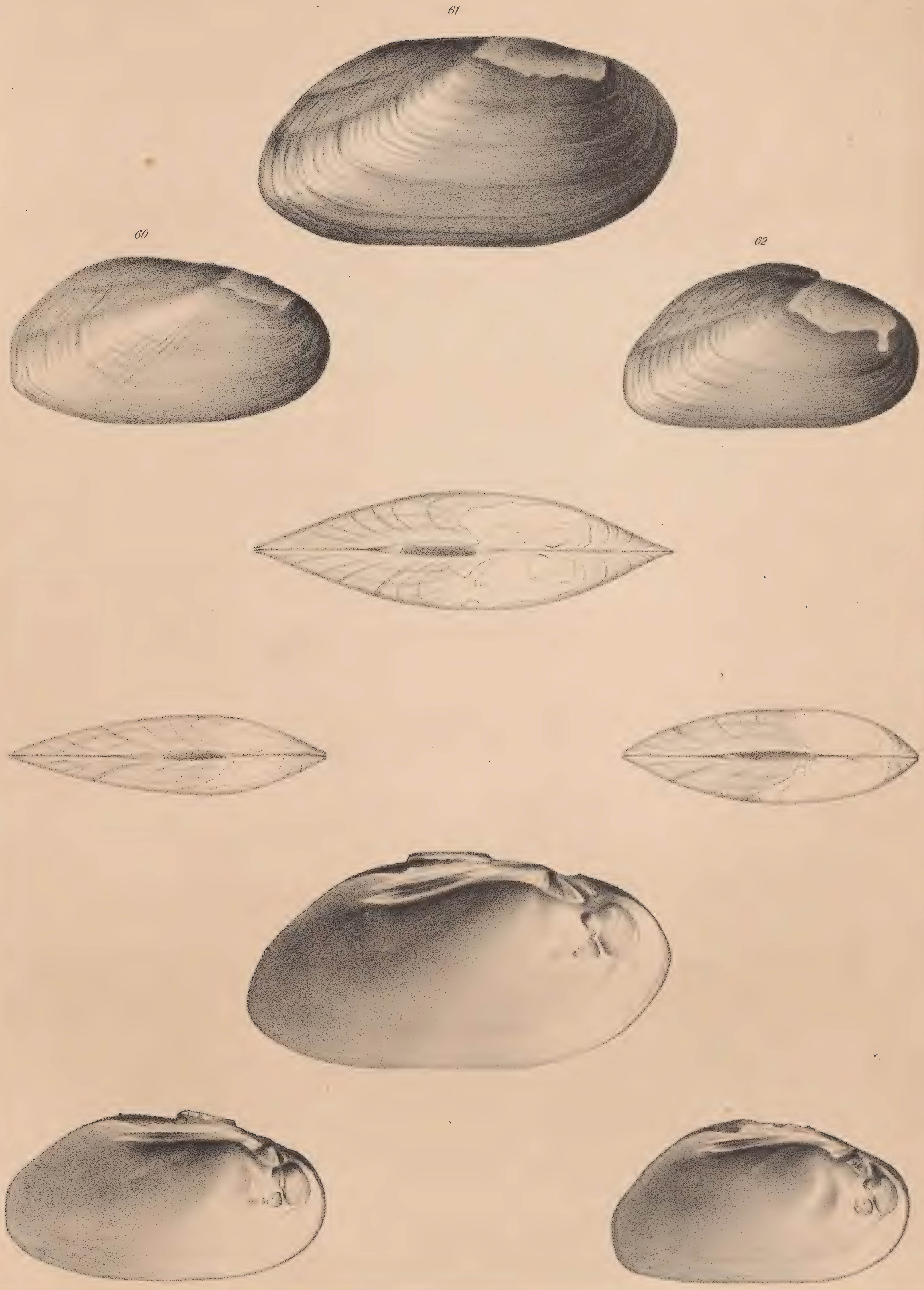
Hab.—Columbus, Georgia, G. Hallenbeck; Russell Co., Georgia, Dr. Neisler; Irwin's Creek, North Carolina, C. M. Wheatley.

My cabinet and cabinets of C. M. Wheatley and Dr. Lewis.

Diam. ·7, Length 1·1, Breadth 2·2 inches.

Shell smooth, oblong, somewhat compressed, flattened at the sides, very inequilateral, subbiangular behind and rounded before; valves rather thick, somewhat thicker before; beaks somewhat prominent; ligament small, thin and dark brown; epidermis dark brown and obscurely rayed, with rather close marks of growth; umbonial slope obtusely angular; posterior slope compressed, narrow elliptical, with a broad slight impression from the beaks to margin; cardinal teeth rather small and sulcate; lateral teeth rather long, curved and lamellar; anterior cicatrices distinct, rather small and well impressed; posterior cicatrices confluent, rather large and moderately impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks very shallow; nacre livid color and iridescent.

Remarks.—Nearly a dozen specimens have been in my possession for some time, without my being able to place them in any species with which I am acquainted. It is near *basalis* herein described, but the beaks are not so medial, and it is smaller and more compressed. It is also higher in the wing and more obliquely rayed. Neither of those before me is perfect enough in the beaks to display undulations of the tips.



60 *Unio Dooleyensis.*
61 *Unio Gesnerii.*
62 *Unio invenustus.*

SOFT PARTS OF UNIONIDÆ.

Unio Tappanianus, Lea.

Soft Parts.—*Branchial uterus* occupies more than two-thirds of the anterior portion of the outer branchiæ, the sacks being filled with mature embryos as well as ova which had merely segmented. *Branchia* large, semicircular, inner ones the larger, free the whole length of the abdominal sack. *Palpi* small, obliquely triangular, united only at the upper posterior edges. *Mantle* thin, with a rather thick, broad border. *Branchial opening* rather small, with small papillæ on the inner edges. *Anal opening* small, without papillæ on the edges, but slightly crenulate. *Super-anal opening* rather long and united below. Color of the mass light salmon?

Remarks.—I owe to the kindness of Prof. S. S. Haldeman the specimen from which the above description was made. He had had it for a long time in alcohol, and it was not in a very good state for description. It was, however, a well developed female and the embryonic form was easily made out.

Unio Rowellii, Lea.

Soft Parts.—Several specimens were sent to me in alcohol by Mr. J. McNiel, having taken them in Estero Real, Nicaragua, West Coast. None had ova in the ovarium or branchial uterus. *Branchiæ* large, inner ones the larger, curved below, free the whole length of abdominal sack. *Palpi* small, oblique, united towards the top. *Mantle* very thin, thickened at the margin. *Branchial opening* large with numerous dark brown papillæ. *Anal opening* large, dark colored, with very minute numerous papillæ. *Super-anal opening* not large, united below. Color of the mass white.

For *hard parts* see Observations on Unio, vol. vii. p. 74, and Journ. Acad. Nat. Sci., 1859.

Anodonta Leonensis, Lea.

Soft Parts.—Seven specimens were sent to me by Dr. John H. Janeway, Post Surgeon at Fort Hays, Kansas, having taken them in the Smoky Hill River branch of the Kansas. Three had charged branchial uterus. No ova in the ovaries. *Branchiæ* large, gently curved below, free the whole length of abdominal sack. *Palpi* large, ovate, united half way on posterior edge. *Mantle* thin, thick on the border. *Branchial opening* large, black, with large papillæ. *Anal opening* not large, black and without papillæ. *Super-anal opening* long, black, and free above. Color of the mass whitish. The form of the embryonic shell is very like that of *Ferussaciana* (nobis), but is a little broader.

For *hard parts* see Observations on Unio, vol. xi. p. 29, and Journ. Acad. Nat. Sci., 1864.

UNIO HYDEIANUS, Lea.

Soft Parts.—Four males and one female were received from Dr. G. W. Lawrence from Ouachita, Arkansas. No ova were found in the ovaries or branchial uterus. *Branchiæ* rather large, inner one much the larger; slightly curved below; united the whole length of abdominal sack. *Palpi* rather small, subtriangular, united near the top. *Mantle* very thin, thicker at the margin. *Branchial opening* large, with rather large papillæ on the inner edges, which are black. *Anal opening* rather small, with numerous rather small papillæ. *Super-anal opening* rather large and united below. Color of the mass whitish.

EMBRYONIC FORMS OF UNIONIDÆ.

UNIO NASHVILLEËNSIS, Lea. Pl. 21, fig. 1. Pouch-shape; dorsal line short and straight; side margins flattened above and curved below; basal margin gently curved; color light brown. Has no hooks. Columbus, Mississippi.

UNIO NASUTUS, Say. Pl. 21, fig. 2. Pouch-shape; dorsal line rather short and straight; side margins regularly curved; basal margin round; color white. Has no hooks. Buffalo, New York.

UNIO PARVUS, Bar. Pl. 21, fig. 3. Pouch-shape; dorsal line short and very slightly curved; side margins regularly curved; basal margin nearly round; color very light brown. Has no hooks. Columbus, Mississippi.

UNIO CONCESTATOR, Lea. Pl. 21, fig. 4. Narrow pouch-shape; dorsal line nearly straight and rather short; side margins gently curved; basal margin nearly round; color clear white. Has no hooks. Columbus, Georgia.

UNIO RUBELLINUS, Lea. Pl. 21, fig. 5. Pouch-shape; dorsal line rather long and slightly curved; side margins much curved, above flattened; basal margin round; color clear white. Has no hooks. Othcalooga Creek, Georgia.

UNIO EXCAVATUS, Lea. Pl. 21, fig. 6. Pouch-shape; dorsal line very slightly curved; side margins much curved, above inflected; basal margin round; color clear white. Has no hooks. Othcalooga Creek, Georgia.

UNIO SUDUS, Lea. Pl. 21, fig. 7. Pouch-shape; dorsal line rather short and nearly straight; side margins gently curved, flattened above; basal margin nearly round; color clear white. Has no hooks. Columbus, Georgia.

UNIO FALLAX, Lea. Pl. 21, fig. 8. Pouch shape; dorsal line rather short and straight; side margins very slightly curved; basal margin nearly round; color clear white. Has no hooks. Columbus, Georgia.

UNIO CLAIBORNENSIS, Lea. Pl. 21, fig. 9. Narrow pouch-shape; dorsal line rather short and straight; side margins straight; basal margin well curved; color nearly clear white; granules very small. Has no hooks. Columbus, Mississippi.

UNIO GIBBOSUS, Bar. Pl. 21, fig. 10. Widely pouch-shape; dorsal line long and straight; side margins slightly curved; basal margin round; color clear white. Has no hooks. Columbus, Mississippi.

UNIO OTHCALOOGENSIS, Lea. Pl. 21, fig. 11. Subrotund; dorsal line long, slightly curved upwards; side margins well bowed; basal margin round; color clear white. Has no hooks. Othcalooga Creek, Georgia.

UNIO TORTIVUS, Lea. Pl. 21, fig. 12. Subrotund; dorsal line rather long and straight; side margins regularly rounded; basal margin round; color clear white. Has no hooks. Columbus, Georgia.

UNIO PURPURATUS, Lam. Pl. 21, fig. 13. Wedge-shape; dorsal line short and straight; side margins at the middle curved outwards, towards the base curved inwards, at the base much curved outwards; basal margin well curved, wider than dorsal, forming acute angles with a minute hooklike process on each angle; clear white. Hooklike processes very small—four—one on each angle of the basal margin. Both valves inflated, being opened at both sides; color light brown; granulations indistinct. *a*, an oblique view showing the interior and two hooks at the base: *b* is a side view showing two of the four hooks: *c* is the broad side view: *d* shows the end of a valve with the two hooks. Columbus, Mississippi.

UNIO TAPPANIANUS, Lea. Pl. 21, fig. 14. Subtriangular; dorsal line long, slightly curved upward in the middle; side margins much inflated above and nearly straight below, forming an obtuse angle below; basal margin with a serrated obtuse angle. Has well developed hooks; color light brown. Columbia, Pennsylvania.

MARGARITANA SPILLMANII, Lea. Pl. 21, fig. 15. Subtriangular; dorsal line very long and nearly straight, slightly raised in the middle; side margins much inflated above and slightly curved below; basal margin rounded, furnished with imperfect hooks; color light brown. Columbus, Mississippi.

INDEX.

PAGE

Unio acuens, 31
" amplus, 43
" Andersonensis, 40
" appressus, 16
" attenuatus, 45
" basalis, 52
" bellulus, 54
" brevis, 39
" Cahabensis, 21
" circumactus, 19
" cirratus, 59
" Claibornensis (embryo), 73
" Conasaugaensis, 37
" concestator (embryo), 72
" conspicuus, 38
" corneus, 63
" crudus, 18
" curvatus, 42
" cuspidatus, 47
" differtus, 46
" dissimilis, 57
" dispansus, 23
" Dooleyensis, 68
" exacutus, 49
" excavatus (embryo), 72
" fallax (embryo), 73
" flavidus, 32
" Gesnerii, 69
" gibbosus (embryo), 73
" globatus, 9
" hastatus, 60
" Hydeianus (soft parts), 72
" infuscus, 55
" infulgens, 64
" insolidus, 44
" invenustus, 70
" Irwinensis, 48
" Jeffreysianus, 27
" Lawii, 12
" lenticularis, 34
" ligatus, 53
" litus, 21
" Macnielii, 29

PAGE

Unio Nashvilleënsis (embryo), 72
" nasutus (embryo), 72
" oblongus, 56
" obuncus, 13
" Othcaloogensis (embryo), 73
" parvus (embryo), 72
" pattinoides, 20
" pauciplicatus, 33
" Pealei, 30
" purpuratus (embryo), 73
" radiolus, 25
" radiosus, 17
" ratus, 56
" recurvatus, 14
" rostellum, 48
" Rowellii (soft parts), 71
" rubellinus (embryo), 72
" Santeënsis, 24
" simulans, 22
" Stevensii, 26
" strumosus, 61
" subcylindraceus, 62
" subglobatus, 11
" subolivaceus, 61
" subparallelus, 50
" subsquamosus, 51
" sudus (embryo), 73
" Tappanianus (embryo), 73
" Tappanianus (soft parts), 71
" Tellicoensis, 35
" tortivus (embryo), 73
" Tuscumbiensis, 15
" validus, 10
" vesicularis, 41
" Yadkinensis, 36
Margaritana Spillmanii (embryo), 73
Anodonta exilior, 28
" Leonensis (soft parts), 71
Schizostoma Lewisii, 65
Goniobasis baculoides, 66
" Lawrencei, 66
Physa Carltonii, 67
" Wolfiana, 67

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